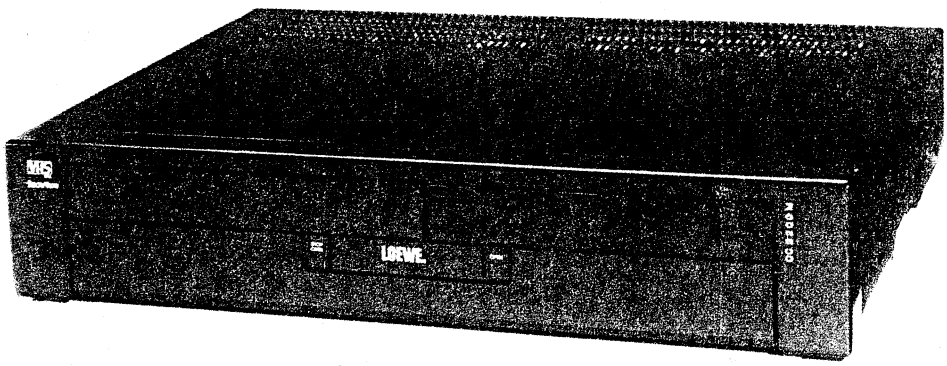
LOEWE.

Kundendienst-
Serviceanleitung



VHS

PAL

Sicherheitsvorschriften

Bei Reparaturarbeiten an den Geräten sind die Sicherheitsbestimmungen gemäß VDE 0860 und Nachträgen zu beachten und einzuhalten.
Spezielle Bauteile in den Geräten dürfen aufgrund ihres Aufbaues nur durch Originalteile ersetzt werden. Außerdem sind die am Reparaturort gültigen Schutzbestimmungen der Bundesgenossenschaft beim Umgang mit diesen Geräten einzuhalten. Hierzu gehört auch die Beschaffenheit des Arbeitsplatzes.
Die Kenntnis dieser Vorschriften ist die Voraussetzung, um einen fachgemäßen Service der Geräte durchführen zu können.
Bei Betrieb dieser Geräte im Ausland sind die jeweiligen Schutzbestimmungen des Landes zu berücksichtigen und einzuhalten.

SAFETY PRECAUTIONS

The following precautions should be observed when servicing.

1. Since many parts in the unit have special safety-related characteristics, always use genuine LOEWE replacement parts.
   Especially critical parts in the power circuit block should not be replaced with other makes.
2. Before returning a repaired unit to the customer, the service technican must thoroughly test the unit to ascertain that it is completely safe to operate without danger of electrical shock.

Norme die sicurezza

Effettuando dei lavori di riparazione sugli apparecchi bisogna osservare e rispettare le disposizioni di sicurezza a norma VDE 0860 e appendici.
Componenti speciali negli apparecchi vanno sostituiti, causa la loro composizione, solo con ricambi originali. Vanno inoltre rispettate le disposizioni di sicurezza dell'ente di assicurazione contro gli infortuni sul lavoro in vigore nel luogo di riparazione. Cio vale anche per le condizioni del posto di lavoro. La cognizione di tali norme costituisce la premessa per poter effettuare un'assistenza tecnica a regola d'arte.
Impiegando gli apparecchi all'estero occorre rispettare ed attenersi alle norme di sicurezza del rispettivo paese.

VHS
OC 2200 M
Videorecorder
Art.-Nr.52522

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230-90251.900

INTRODUCTION

This service manual provides a variety of service information. It contains the mechanical structure of the Video Cassette Recorder(VCR) together with mechanical adjustments and the electronic circuits in schematic form. This VCR was manufactured and assembled under our strict quality control standards and meets or exceeds industry specifications and standards.

TOTAL CONTENTS

SECTION 1·····SUMMARY
SECTION 2·····CABINET & MAIN FRAME
SECTION 3·····ELECTRICAL
SECTION 4·····MECHANISM

NOTE) This section is provided separately. When checking the mechanical problems, refer to the manual (Part No. 494-004X) provided separately.

SECTION 1

SUMMARY

CONTENTS

KEY TO ABBREVIATIONS.....1-2
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- Precautions during Servicing

SAFETY CHECK AFTER SERVICING.....1-4
- Insulation resistance test
- Dielectric strength test
- Clearance distance
- Leakage current test

FEATURES.....1-5
SPECIFICATIONS.....1-5
LOCATION OF CUSTOMER CONTROLS.....1-6

KEY TO ABBREVIATIONS

A	AC	Alternating Current
	ACC	Automatic Colour Control
	ADJ	Adjust
	A/E	Audio Erase
	AFC	Automatic Frequency Control
	AFT	Automatic Fine Tuning
	AGC	Automatic Gain Control
	ALC	Automatic Level Control
	AM	Amplitude Modulation
	AMP	Amplifier
	ANT	Antenna/Aerial
	APC	Automatic Phase Control
	ASS'Y	Assembly
	AUD	Audio
	AUTO	Automatic
	AUX	Auxiliary
B	B	Base
	BPF	Bandpass Filter
	BW or B/W	Black and White
C	C	Capacitor, Chroma, Collector
	CAN	Cancel
	CAP	Capstan
	CATV	Cable Television
	CBA	Circuit Board Assembly
	CCD	Charge Coupled Device
	CFG	Capstan Frequency Generator
	CH	Channel
	CHROMA	Chrominance
	CLK	Clock
	CNR	Chroma Noise Reduction
	COMB	Combination Comb Filter
	COMP	Comparator Composite Compensation
	CONV	Converter
	CS	Chip Select
	CST	Cassette
	CTL	Control
	CUR	Current
	CYL	Cylinder
D	D	Drum, Digital, Diode, Drain
	dB	Decibel
	DC	Direct Current
	DEMOD	Demodulator
	DET	Detector
	DEV	Deviation
	DHP	Double High Pass
	DIGITRON	Digital Display Tube
	DL	Delay Line
	DOC	Drop Out Compensator
	D/V	Dummy Vertical
E	E	Emitter
	EE	Electric to Electric
	EMP	Emphasis
	EP	Extended Play
	EQ	Equalizer
	ES	Electrostatically Sensitive
F	F	Fuse
	FB	Feed Back
	FBC	Feed Back Clamp
	FE	Full Erase
	FF	Fast Forward
	FG	Frequency Generator
	FL	Filter
	FM	Frequency Modulation
	F/R	Front/Rear
	FS	Frequency Synthesizer
	FSC	Subcarrier Frequency
	F/V	Frequency Voltage
	FWD	Forward
G	GEN	Generator
	GND	Ground
H	H	High, Horizontal
	Hz	Hertz
I	IC	Intergrated Circuit
	IF	Intermediate Frequency
	INS	Insert
	I/O	Input/Output
L	L	Low, Left, Coil
	LD	LED
	LECHA	Letter Character
	LP	Long Play
	LPF	Low Pass Filter
M	MAX	Maximum
	MD	Modulator
	MIC	Microphone
	MIN	Minimum
	MIX	Mixer, Mixing
	M.M	Mono Multi Vibrator
	MMV	Monostable Multivibrator
	MOD	Modulation, Modulator
	MODEM	Modulator-Demodulator
N	NR	Noise Reduction
O	OSC	Oscillator
	OSD	On Screen Display
P	PB	Playback
	PCB	Printed Circuit Board
	PG	Pulse Generator
	PLL	Phase Locked Loop
	P-P	Peak-to-Peak
	PRE-AMP	Preamplifier
	PS	Phase Shift
	PWM	Pulse Width Modulation
Q	Q	Transistor
	QH	Quasi Horizontal
	QSR	Quick Setting Record
	QTR	Quick Timer Record
	QV	Quasi Vertical
R	R	Resistor, Right
	RE(or RC)	Remocon, Receiver
	REC	Recording
	REF	Reference
	REG	Regulated, Regulator
	REMOCON	Remote Control(unit)
	REV	Reverse
	REW	Rewind
	RF	Radio Frequency
	R/P	Record/Playback
	RTC	Real Time Counter
S	S	Serial
	SH	Shift
	SHARP	Sharpness
	SIF	Sound Intermediate Frequency
	SLD	Side Locking
	S/N	Signal to Noise Ratio
	SP	Standard Play
	SUB	Subtract, Subcarrier
	SW or S/W	Switch
	SYNC	Synchronization
	SYSCON	System Control
T	T	Coil
	TP	Test Point
	TR	Transistor
	TRK	Tracking
	TRANS	Transformer
	TU	Tuner, Take-Up
U	UHF	Ultra High Frequency
	UNREG	Unregulated
V	V	Volt, Vertical
	VA	Always Voltage
	VCO	Voltage Controlled Oscillator
	VGC	Voltage Gain Control
	VHF	Very High Frequency
	VISS	VHS Index Search
	VR	Variable Resistor
	V-Sync	Vertical Synchronization
	VTG	Voltage
	VV	Voltage to Voltage
	VXO	Voltage X-tal Oscillator
W	W	Watt
	WHT	White
	W/O	With Out
X	X-TAL	Crystal
Y	Y/C	Luminance/Chrominance
	YNR	Luminance Noise Reduction
Z	ZD	Zener Diode

IMPORTANT SAFETY PRECAUTIONS

Prior to shipment from the factory, the products are strictly inspected to conform with the recognized product safety and electrical codes of the countries in which they are to be sold. However, in order to maintain such compliance, it is equally important to implement the following precautions when a set is being serviced.

• Precautions during Servicing

1. Locations requiring special caution are denoted by labels and inscriptions on the cabinet, chassis and certain parts of the product. When performing service, be sure to read and comply with these and other cautionary notices appearing in the operation and service manuals.

2. Parts identified by the ⚠ symbol and shaded (▨) parts are critical for safety.
   Replace only with specified part numbers.
   Note: Parts in this category also include those specified to comply with X-ray emission standards for products using cathode ray tubes and those specified for compliance with various regulations regarding spurious radiation emission.

3. Use Specified internal wiring. Note especially:
   1) Wires covered with PVC tubing
   2) Double insulated wires
   3) High voltage leads

4. Use specified insulating materials for hazardous live parts. Note especially:
   1) Insulation Tape
   2) PVC tubing
   3) Spacers
   4) Insulation sheets for transistor

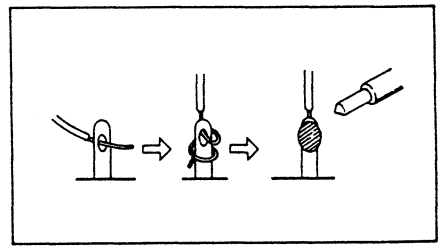


Fig. 1

5. When replacing AC primary side components (transformers, power cords, noise blocking capacitors, etc.) wrap ends of wires securely about the terminals before soldering.(Fig. 1)

6. Observe that wires do not contact heat producing parts (heatsinks, oxide metal film resistors, fusible resistors, etc.)

7. Check that replaced wires do not contact sharp edged or pointed parts.

8. When a power cord has been replaced, check that 10-15Kg of force in any direction will not loosen it.(Fig. 2)

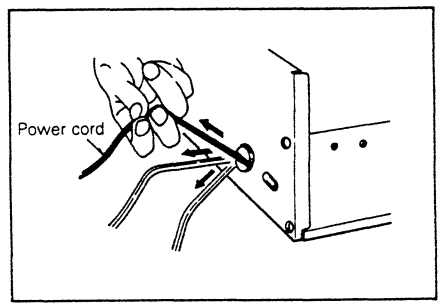


Fig. 2

9. Also check areas surrounding repaired locations.

10. Products using cathode ray tubes (CRTs)
    In regard to such products, the cathode ray tubes themselves, the high voltage circuits, and related circuits are specified for compliance with recognized codes pertaining to X-ray emission. Consequently, when servicing these products, replace the cathode ray tubes and other parts with only the parts specified. Under no circumstances attempt to modify these circuits. Unauthorized modification can increase the high voltage value and cause X-ray emission from the cathode ray tube.

SAFETY CHECK AFTER SERVICING

Examine the area surrounding the repaired location for damage or deterioration. Observe that screws, parts and wires have been returned to original positions. Afterwards, perform the following tests and confirm the specified values in order to verify compliance with safety standards.

- **Insulation resistance test**

  Confirm the specified insulation resistance or greater between power cord plug prongs and externally exposed parts of the set (RF terminals, aerial terminals, video and audio input and output terminals, microphone sockets, earphone sockets, etc.). See table below.

- **Dielectric strength test**

  Confirm specified dielectric strength or greater between power cord plug prongs and exposed accessible parts of the set (RF terminals, aerial terminals, video and audio input and output terminals, microphone sockets, earphone sockets, etc.). See table below.

- **Clearance distance**

  When replacing primary circuit components, confirm specified clearance distance (d), (d') between soldered terminals, and between terminals and surrounding metallic parts. See table below.

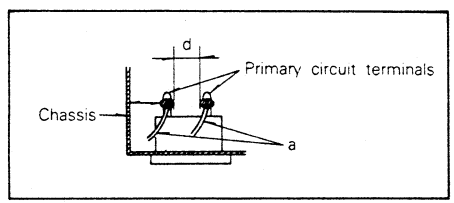


Fig. 3

Table 1:Ratings for selected areas

AC Line Voltage	Region	Insulation Resistance	Dielectric Strength	Clearance Distance(d),(d)
*110 to 130 V 200 to 240 V	Europe Australia	≧10 MΩ/500 V DC	4kV 1 minute	≧6mm(d) ≧8mm(d) (a Power cord)

*Class II model only.

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

- **Leakage Current test**

  Confirm specified or lower leakage current between B(earth ground, power cord plug prongs) and externally exposed accessible parts (RF terminals, aerial terminals, video and audio input and output terminals, microphone sockets, earphone sockets, etc.)

  Measuring Method: (Power ON)
  Insert load Z between B(earth ground, power cord plug prongs) and exposed accessible parts. Use an AC voltmeter to measure across both terminals of load Z. See figure and following table.

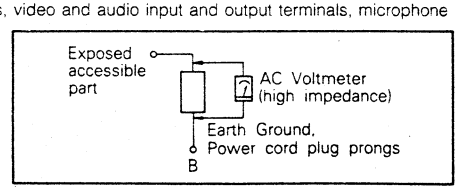


Fig. 4

Table 2:Leakage current ratings for selected areas

AC Line Voltage	Region	Load Z	Leakage Current(i)	Earth Ground (B) to:
100 to 130 V	Europe	2kΩ	i≦0.7m A peak i≦2m A dc	Antenna earth terminals
200 to 240 V	Australia	50kΩ	i≦0.7m A peak i≦2m A dc	Other terminals

Note. This table is unofficial and for reference only. Be sure to confirm the precise values for your particular country and locality.

FEATURES

- HQ, High Quality picture enhancement system improves image sharpness and detail
- Digital Link System
- 8 event/1 year programmable timer with everyday recording
- QSR, Quick Set Recording with standby (up to 9 hours)
- TV Programmer
- SHOW VIEW
- Assemble Cut Improvement
- Premiere, VPS (Video Programme System)
- Programmable channel memory with frequency synthesized tuner (up to 40 positions)
- Full-function infrared remote control
- Auto Power and Play function
- Automatic rewind
- Fine Still, Frame Advance
- Synchronized Edit function
- Tape Remaining time display function
- Jet Search, Logic Search Function
- Quick Start Function
- Real Time Counter
- Digital Auto Tracking System
- Auto Head Cleaner
- Child Lock

* ShowView is a trademark applied for by Gemstar Development Corp.
ShowView system is manufactured under license from Gemstar Development Corporations.

SPECIFICATIONS

General

Power Source :	AC 230V±10%, 50Hz
Power Consumption :	Approx. 33 Watts
Video Recording System :	Double Azimuth 2 heads helical scanning system
Tape Speed :	23.39mm/sec (SP mode)
Tape Format :	Tape Width 1/2" (12.7mm high density tape VHS).
Maximum Recording Time :	4hours at SP mode (with E-240 cassette)
FF/Rewind Time :	Less than 300secs (with E-180 cassette)
Dimensions (W×H×D) :	16.9"×3.4"×14.2" (430×86×361mm)
Weight :	About 13.88 lbs (6.3kg)
Operating Temperature :	41°F-95°F (5°C-35°C)
Operating Humidity :	35%~80%
Timer :	24hours display type

Video

Television System :	CCIR standard (625 lines, 50 fields) PAL/SECAM Colour signal
Recording Format :	PAL/MESECAM
RF Reception :	PAL B/G, SECAM B/G
RF OUT :	PAL G, SECAM G
Input Level :	VIDEO IN (SCART-PIN, RCA type) 2.0Vp-p, 75ohm, unbalanced
Output Level :	VIDEO OUT (SCART-PIN, RCA type) 2.0Vp-p, 75ohm, unbalanced
Signal to Noise Ratio :	More than 45dB
RF Modulator :	UHF Channels 32-40 (Adjustable)

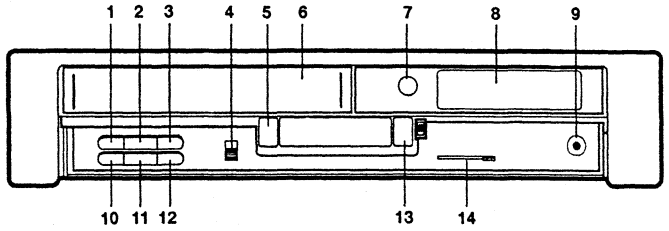
Audio

Input Level :	AUDIO IN 0dBm More than 50Kohm (SCART-PIN, FRONT RCA type)
Output Level :	AUDIO OUT 0dBm Less than 1Kohm (SCART-PIN type)
Audio Track :	Mono track type
Audio Frequency Response :	Normal : 100Hz~10KHz ($^{+3}_{-6}$ dB)
Signal to Noise Ratio :	More than 43dB (JIS A Filter)

* Designs and specifications are subject to change without notice.

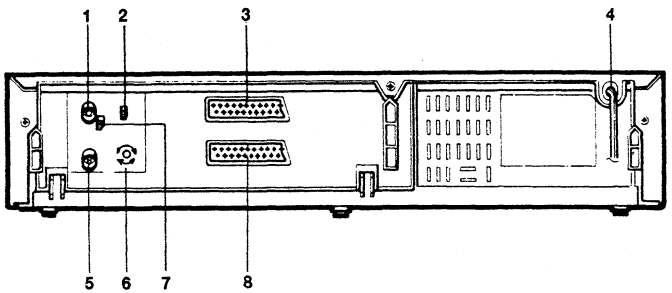
LOCATION OF CUSTOMER CONTROLS

FRONT



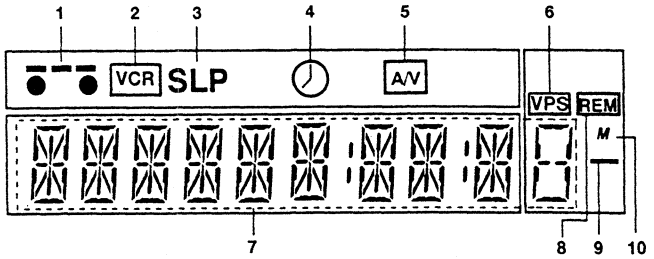
1. REWIND / REVIEW BUTTON
2. PLAY BUTTON
3. FAST FORWARD/CUE BUTTON
4. TV/VCR CONTROL SWITCH
5. STOP/CASS BUTTON
6. CASSETTE COMPARTMENT
7. REMOTE SENSOR WINDOW
8. MULTI-FUNCTION DISPLAY
9. SYNCHRO EDIT IN SOCKET
10. POWER BUTTON
11. PAUSE/STILL BUTTON
12. RECORD BUTTON
13. CONTROL PANEL OPEN BUTTON
14. SHARPNESS CONTROL

REAR



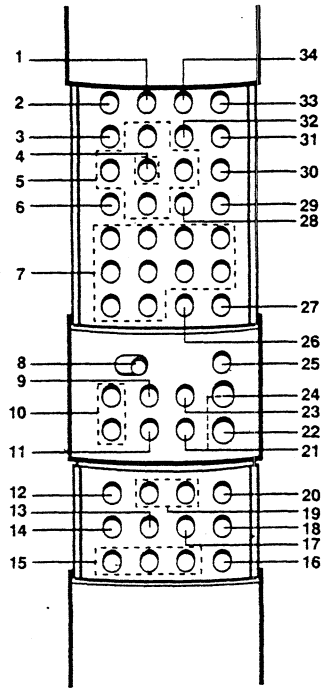
1. AERIAL INPUT
2. TPSG ON/OFF SWITCH
3. EURO-AV 1 SOCKET
4. MAINS LEAD
5. RF OUTPUT
6. RF CHANNEL CONTROL
7. ATTENUATION (ATT.) SWITCH
8. EURO-AV 2 SOCKET

MULTIFUNCTION DISPLAY



1. CASSETTE-IN INDICATOR
2. VCR INDICATOR
3. TAPE SPEED INDICATOR
4. TIMER INDICATOR
5. LINE INDICATOR
6. VPS INDICATOR
7. FUNCTION INDICATORS
8. TAPE REMAINING INDICATOR
9. MINUS INDICATOR
10. MEMORY INDICATOR

REMOTE CONTROL



1. TELETEXT STOP BUTTON
2. DOUBLE BUTTON
3. VPT YELLOW BUTTON
4. TELETEXT ENTER BUTTON
5. CURSOR BUTTONS (UP, DOWN, LEFT, RIGHT)
6. AV BUTTON
7. NUMBER BUTTONS "0" THROUGH "9"
8. TV/VCR CONTROL SWITCH
9. REWIND/REVIEW BUTTON
10. PROGRAMMING (+/-)/TRACKING (+/-) BUTTONS
11. PAUSE/STILL/FRAME ADVANCE BUTTON
12. SHOW VIEW BUTTON
13. AUDIO DUBBING BUTTON
14. AUTO TRACKING BUTTON
15. VISS BUTTONS (MARK, ERASE)
16. RESET BUTTON
17. TAPE SPEED SELECT BUTTON
18. CLOCK/COUNTER SELECT BUTTON
19. SLOW (+/-)/MFT (+/-) BUTTONS
20. DISPLAY BUTTON
21. RECORD BUTTON
22. STOP BUTTON
23. FAST FORWARD/CUE BUTTON
24. PLAY BUTTON
25. POWER BUTTON
26. TELETEXT CLEAR BUTTON
27. MENU BUTTON
28. TOP BUTTON
29. TELETEXT BUTTON
30. VPT BUTTON
31. VPS/SUBPAGE BUTTON
32. CYAN BUTTON
33. CHILD LOCK BUTTON
34. REVEAL BUTTON

SECTION 2

CABINET & MAIN FRAME

CONTENTS

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2. Front Panel 2-2

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2. Main Circuit Board (I) (Y/C, Audio, Tuner/IF, Syscon, Servo) 2-3
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CABINET DISASSEMBLY

1. Top Case, Bottom Cover

A. Release 7 screws A (See Fig. 2-1).
B. Hold the back of Top Case and lift it up slightly backward to remove it.
C. Release 9 screws B to remove the Bottom Cover (See Fig. 2-1).

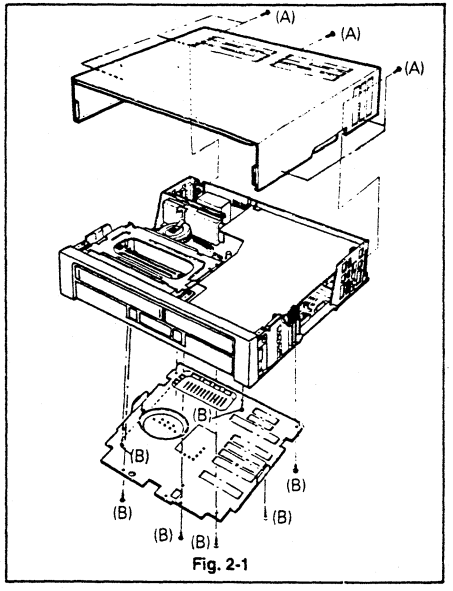


Fig. 2-1

***Caution**
When reassemble the Front Panel, assemble it in condition of inserting the Cassette Door inside, as shown in Fig. 2-3.

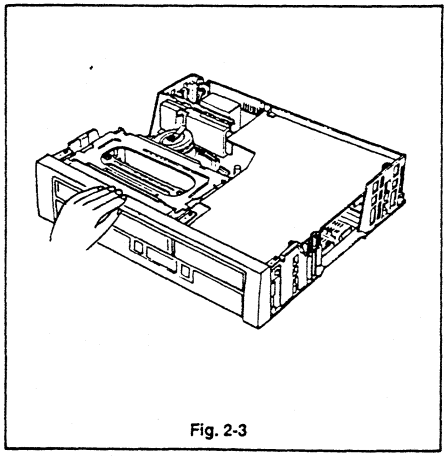


Fig. 2-3

2. Front Panel

A. Remove the Top Case (See Fig. 2-1).
B. Remove the Bottom Cover (See Fig. 2-1).
C. Release 2 screws C (See Fig. 2-2).
D. Remove the stoppers on the top of Front Panel.
E. Remove the stoppers on the Bottom side Front Panel.

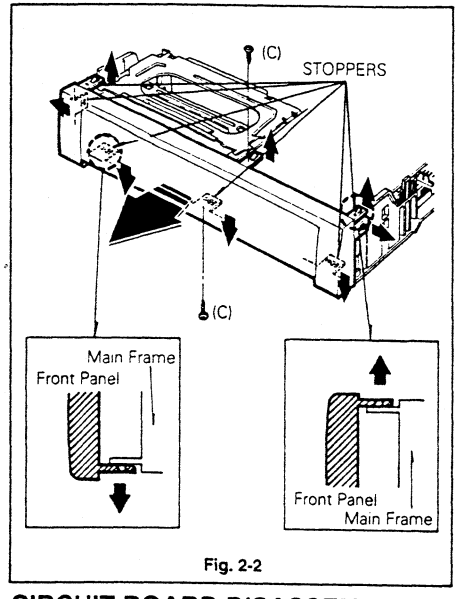


Fig. 2-2

CIRCUIT BOARD DISASSEMBLY

1. Circuit Board Arrangement

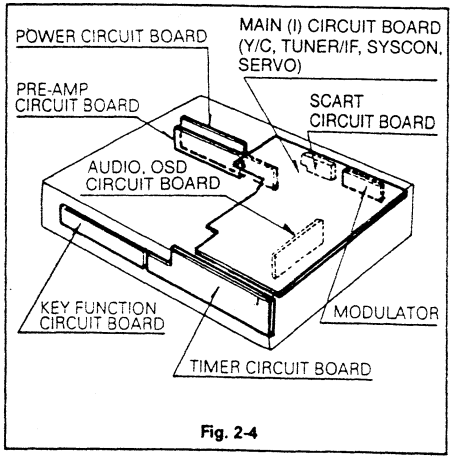


Fig. 2-4

2. Main Circuit Board (I) (Y/C, Audio, Tuner/IF, Syscon, Servo)

A. Release 2 screws D. (See Fig. 2-5)
B. Disconnect the connector between Main and Timer Circuit Board.
C. Lift the rear part up and Pull the P.C.Board backward.
D. Remove the connector for complete removal.

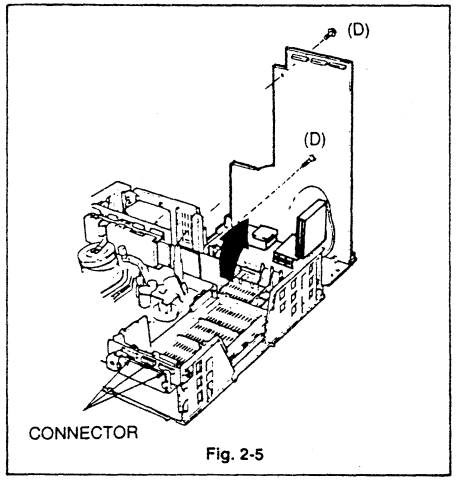


Fig. 2-5

3. Timer/Key Function Circuit Board

A. Pull the P.C.Board toward you while pressing 11 stoppers in the direction of the arrows to disengage and remove the P.C.Board (See Fig. 2-6).
B. Remove the connector for complete removal.

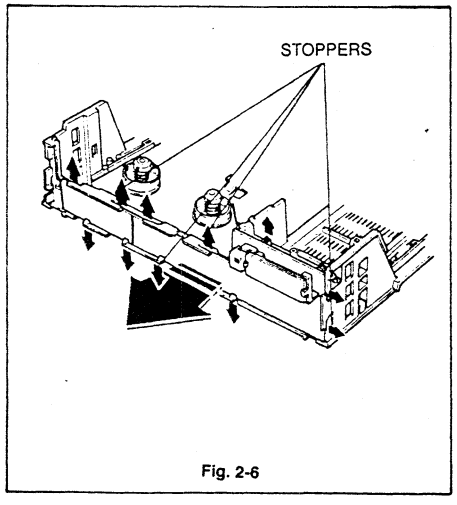


Fig. 2-6

4. Pre-Amp Circuit Board

A. Release 2 screws E.
B. Remove the Plate Pre-Amp on the Pre-Amp Ass'y.
C. Release 2 screws F.
D. Remove Pre-Amp Package from Main Frame.
E. Remove bracket Pre-Amp from Pre-Amp package.
F. Remove Pre-Amp Circuit Board from Pre-Amp package.

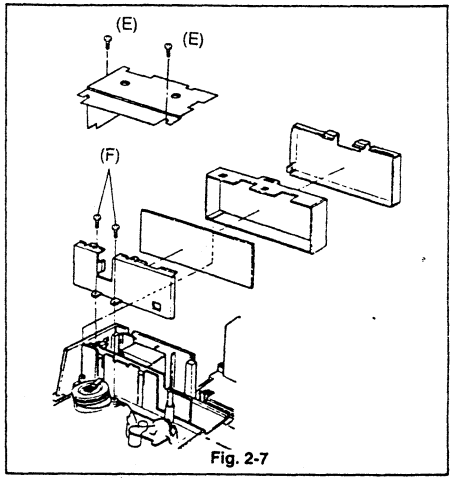


Fig. 2-7

5. Power Circuit Board

A. Remove Main (I) P.C.Board (See Fig. 2-5).
B. Release 4 screws G.

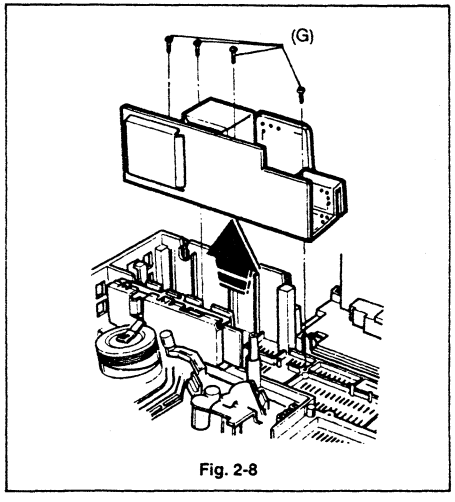
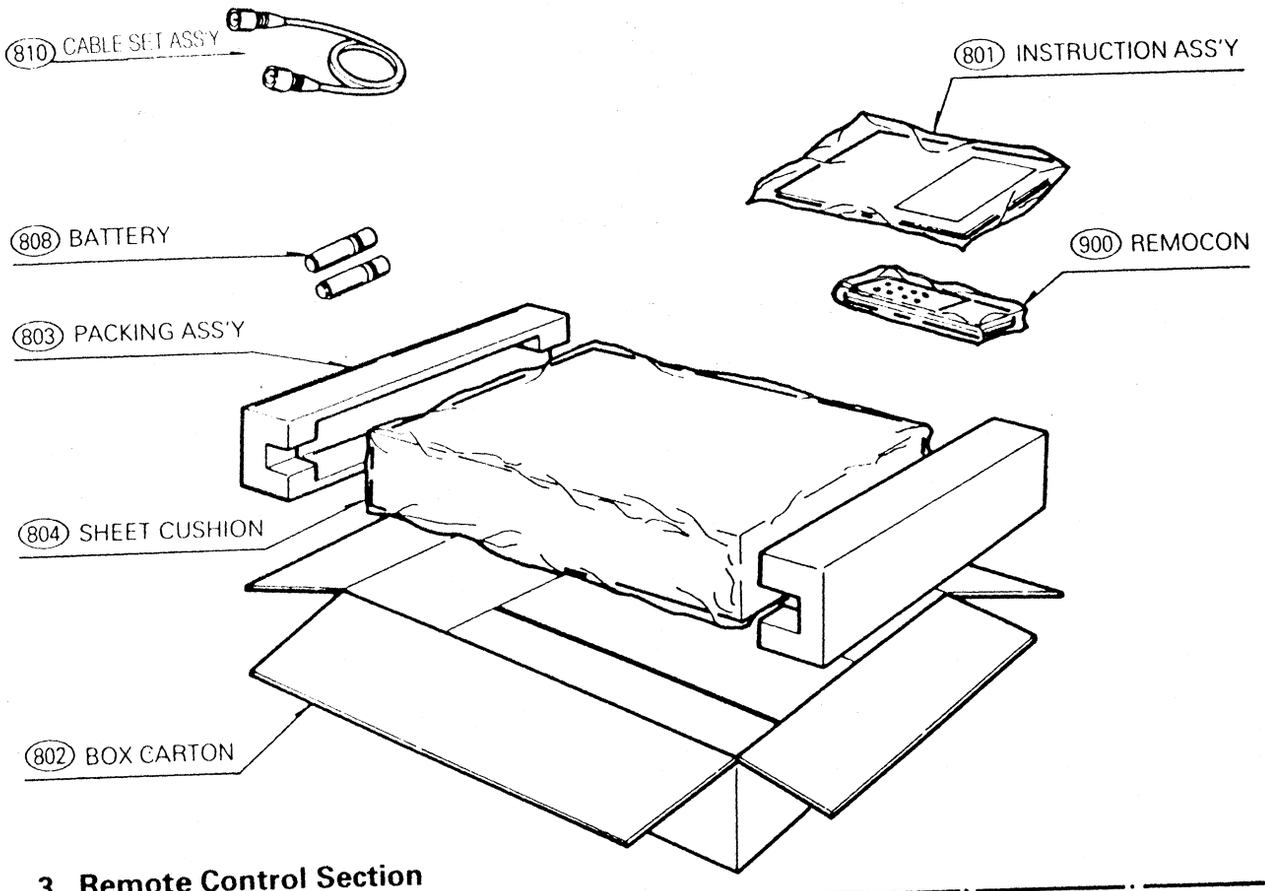
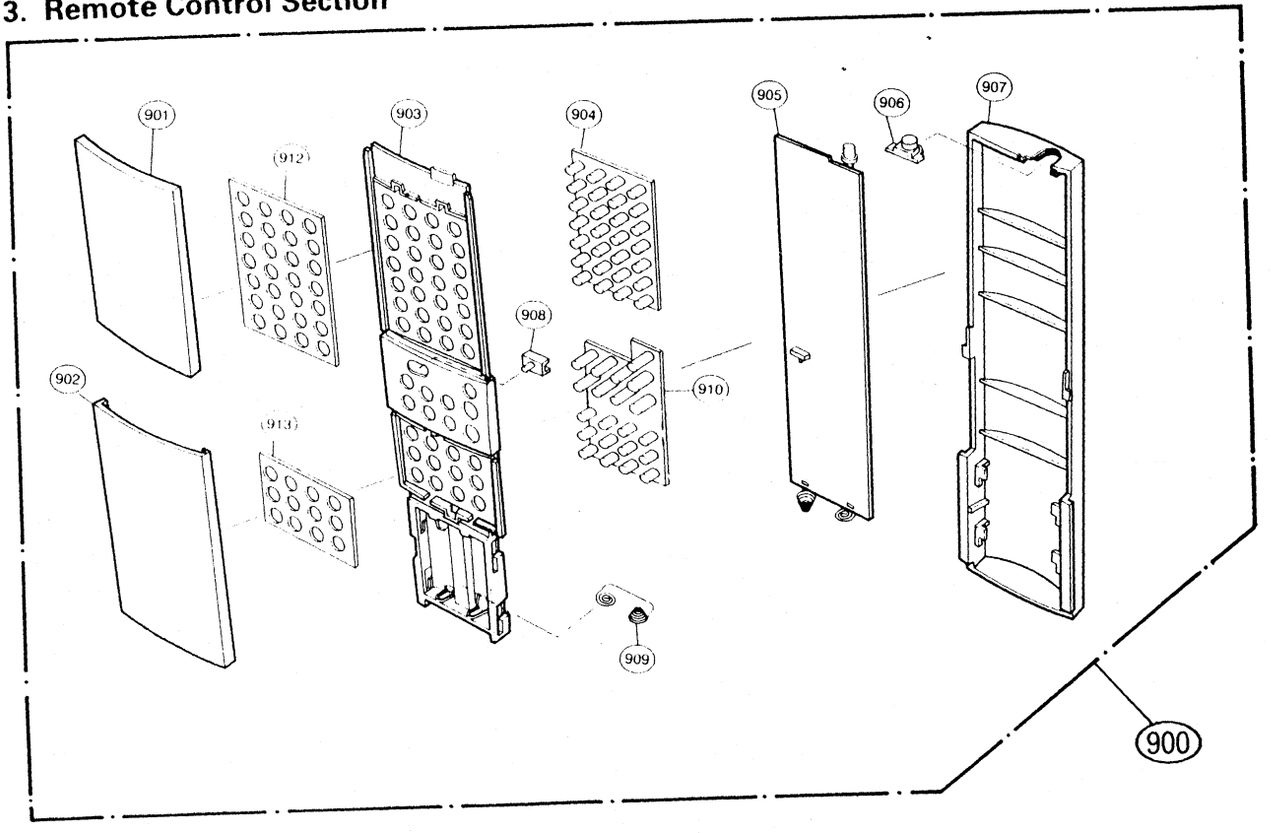


Fig. 2-8

2. Packing Accessory Section



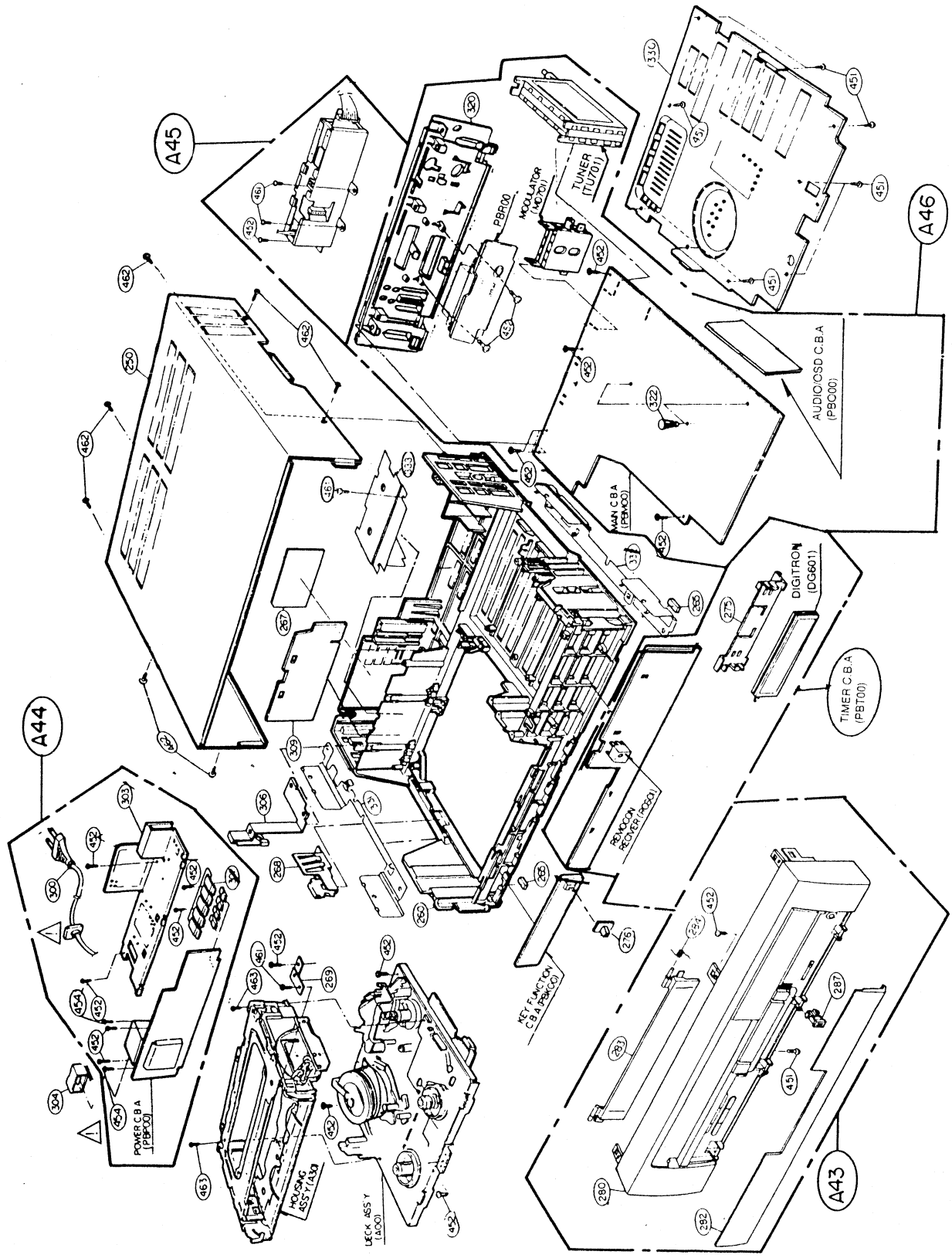
3. Remote Control Section



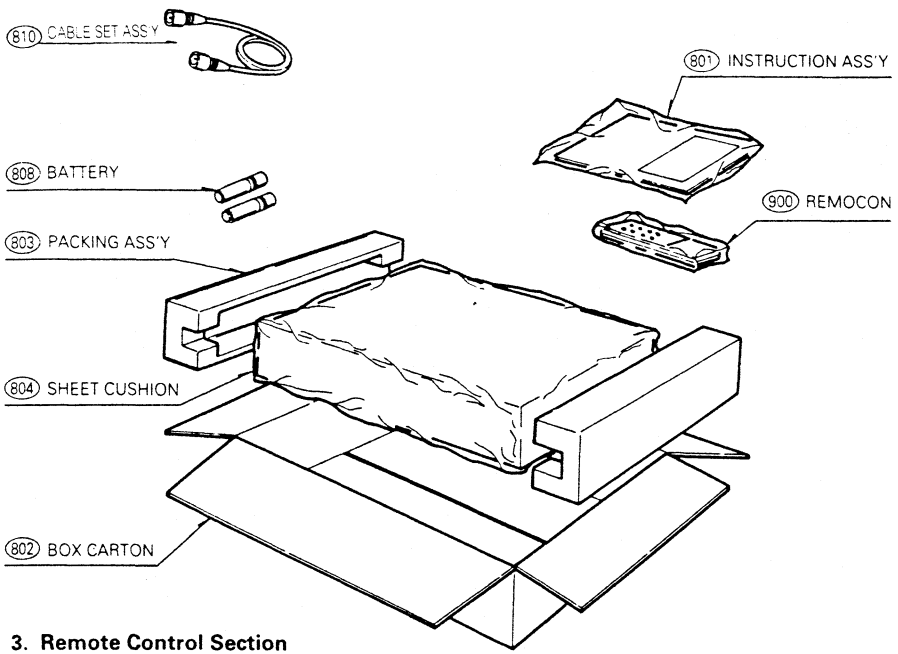
EXPLODED VIEWS

1. Cabinet and Main Frame Section

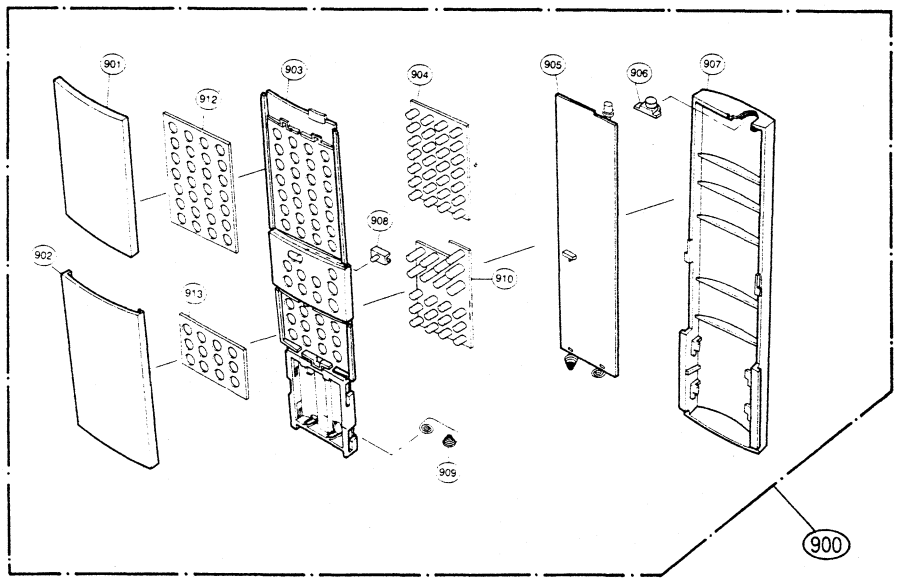
NOTE: 1. The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.



2. Packing Accessory Section



3. Remote Control Section



SECTION 3 ELECTRICAL

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ELECTRICAL ADJUSTMENT PROCEDURES

Electronic Test Equipment Requirement:

- Oscilloscope
- Video Signal Generator
- Modem Tester
- Level Meter
- Frequency Counter
- Sweep/Marker OSC
- + Driver
- Test Tape (SP)
- Recording Tape
- Digital Multimeter
- Distortion Meter

1. Servo Circuit

1) ±PG Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Playback	6.5H±0.5H (416μ sec, 1H=64μ sec)	TP303 (W3B6) TP301 (W797)	VR201

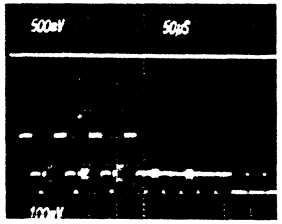
Purpose:
It is for the phase dividing of the Video A, B heads with 180° and the exact tracing of each track to meet head switching point with VHS Spec.

Procedure:
a. Playback a PAL/SP test tape.
b. At this time, the "ATR" is lighting, after pressing the PROG (+) or PROG (−) and adjust the X-Value.
c. Connect CH-1 terminal of oscilloscope to W3B6 H. SW, and CH-2 terminal to video out terminal (W797) of VCR.
d. Trigger the complex Video signal of CH-2 to CH-1 H. SW, and adjust VR201 so that the distance from A(B) head selection point of H.SW signal to the starting point of horizontal synchronized signal is 6.5H (416μ sec, 1H=64μ sec).

Reference)
1. ±PG adjustment is practiced in the state of maximum RF level and locked servo system. (MTR Mode.)
2. The deviation between A/B Head Adjustment location should be within ±0.5H (32μ sec).
3. The deviation between the specification of adjustment and the practical measurement value should be within ±0.5H (32μ sec).
4. Oscilloscope and VCR set should be connected with GND.

Waveform

Composite Video Signal



6.5H (416μsec)
H. SW (W3B6)

Fig. 3-1

2. Y/C Circuit

1) EE Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Stop	1±0.1Vp-p	TP301 (W797)	VR302

Procedure:
a. Connect the Video Signal Generator to video in terminal.
b. Connect CH-1 terminal of the oscilloscope to W797.
c. Adjust VR302 so that the value from the lower part of synchronism to 100% white signal is 1±0.1Vp-p.

Waveform

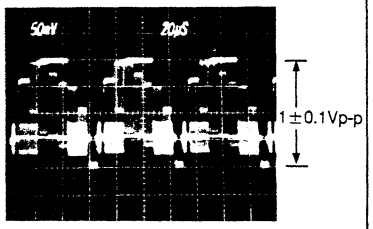


Fig. 3-2

2) Playback Luminance Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Playback (SP mode)	1±0.1Vp-p	TP301 (W797)	VR305

Procedure:
a. Connect the Video Signal Generator to video in terminal.
b. Connect CH-1 terminal of the oscilloscope to W797.
c. Playback a PAL SP test tape (with 100% white signal).
d. Adjust VR305 so that Video Waveform is 1±0.1 Vp-p.

Waveform

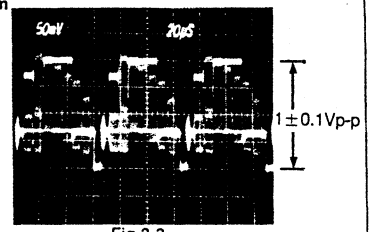


Fig 3-3

3) FM Carrier Frequency Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Record (SP mode)	White Peak : 4.8 - 0.05MHz Sync Tip : 3.8 ± 0.05MHz	TP302 (W367)	VR301

Procedure:
a. Connect the Video Signal Generator to Video in terminal.
b. Connect CH-1 terminal of the oscilloscope to W797.
c. Connect CH-2 terminal of the oscilloscope to modem tester output terminal. (The set and the modem tester should be connected with 1:1 probe).
d. Connect input terminal of modem tester to TP302.
e. Input the Video Signal of 100% white to Video Input Socket.
f. The terminal position of modem tester is operated to be ATT. 0dB, PAL/SECAM mode, Demod. Marker on.
g. Adjust VR301 to right side in left maximum state so that 3.8MHz Marker on scope is agreed with the lower part of sync.

Waveform

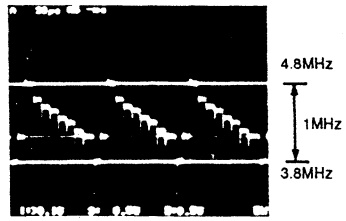


Fig 3-4

4) FM Deviation Frequency Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Record (SP mode)	1 - 0.05MHz	TP302 (W367)	VR304

Procedure:
a. Connect the Video Signal Generator to Video in terminal.
b. Connect CH-1 terminal of the oscilloscope to W797.
c. Connect CH-2 terminal of the oscilloscope to modem tester output terminal. (The set and the modem tester should be connected with 1:1 probe).
d. Connect input terminal of modem tester to TP302.
e. Input the Video Signal of 100% white to Video Input Socket.
f. The terminal position of modem tester is operated to be ATT. 0dB, PAL/SECAM mode, Demod. Marker on.
g. Adjust VR304 to right side in left maximum state so that 4.8MHz Marker on scope is agreed with the level of 100% white signal.

Waveform

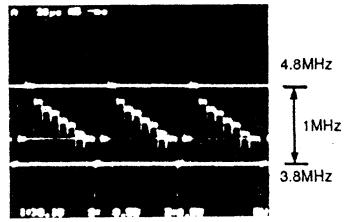


Fig 3-5

5) Recording Luminance Level Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Record (SP mode)	0.75±0.1Vp-p	W805 (Pre-Amp C.B.A) REC Current	VR303 REC-Y

Procedure:

a. Connect the Video Signal Generator to video in terminal.
b. Connect CH-1 terminal of the oscilloscope to W805 of Pre-Amp Circuit Board.
c. Connect CH-2 terminal of the oscilloscope to W797.
d. Adjust VR303 so that the luminance FM output is 0.75±0.1 Vp-p

Waveform

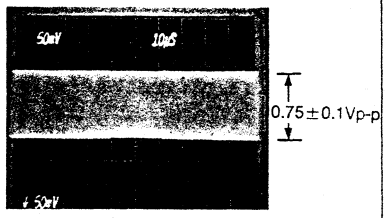


Fig 3-6

3. Audio Circuit

1) Record Oscillation Voltage Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
Record	65±4Vp-p	REC Bias +, -	VR401

Purpose:
This is for adjusting bias voltage to specification in recording.

Procedure:

a. Connect the Level Meter to +, - terminals REC Bias of Main C.B.A. (At this time, Level Meter should be connected with GND).
b. Confirm that the Oscillation Voltage is 65±4Vp-p.
c. At this time, Adjust VR401 so that the Oscillation voltage fit to specification.

4. Tuner/IF Circuit

1) VIF/AFC Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
EE mode (without signal)	Refer to Waveform	IC701 Pin ⑭ (VIF) IC701 Pin ⑪ (AFC)	Z705 (VIF) Z706 (AFC)

Connection:

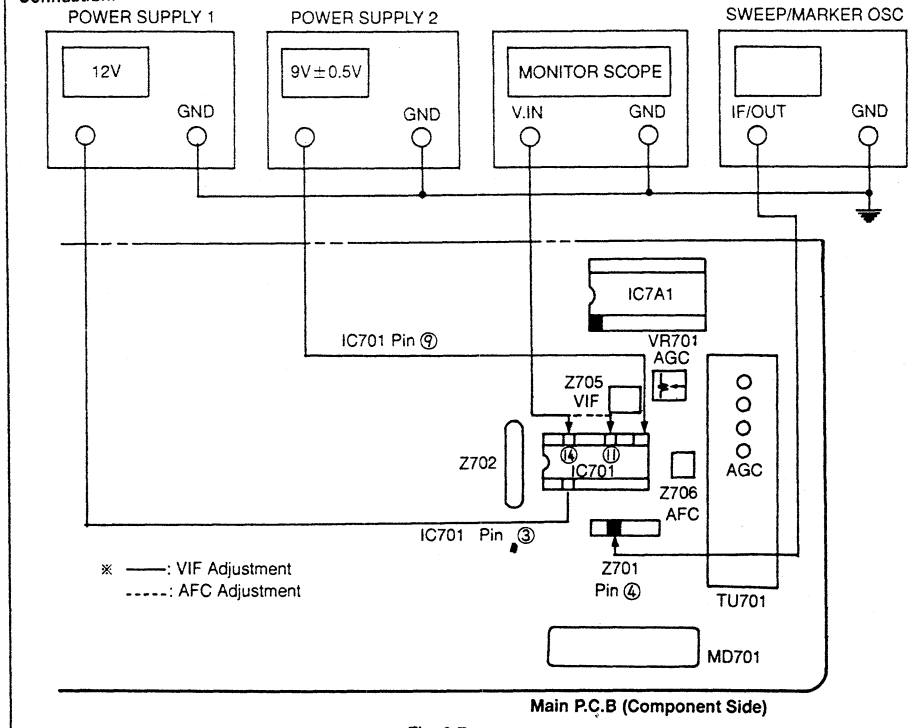


Fig. 3-7

Procedure:

a. Connect as shown in Fig. 3-7.
b. Attenuate the sweep OSC gain by 25±5dB. (Output gain 80~90dBμ).
c. Adjust Z705 and Z706 so that the monitor waveform is as shown in Fig. 3-8.

Waveform

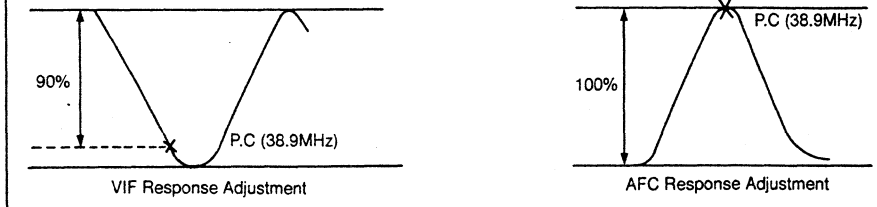


Fig. 3-8

2) AGC Adjustment

MODE	SPECIFICATION	MEASUREMENT POINT	ADJUSTMENT POINT
CH-9 Normal Reception	4.4± 0.1V	TUNER AGC Terminal	VR701

Procedure:
a. Be tuning CH-9 (strength of electric field: 70±1dB μV) fine.
b. Connect the Digital Voltmeter to AGC terminal of TU701.
c. Adjust VR701 so that the Digital Voltmeter is 4.4±0.1V.

Reference:
Maintain the input gain in adjusting AGC faithfully.

***Caution in testing**
1. Switch VCR on for at least 10minutes before attempting these adjustments.
2. Adjust after completing self test of measuring apparatus.
3. Sweep OSC marker frequency is followed by Table 1.

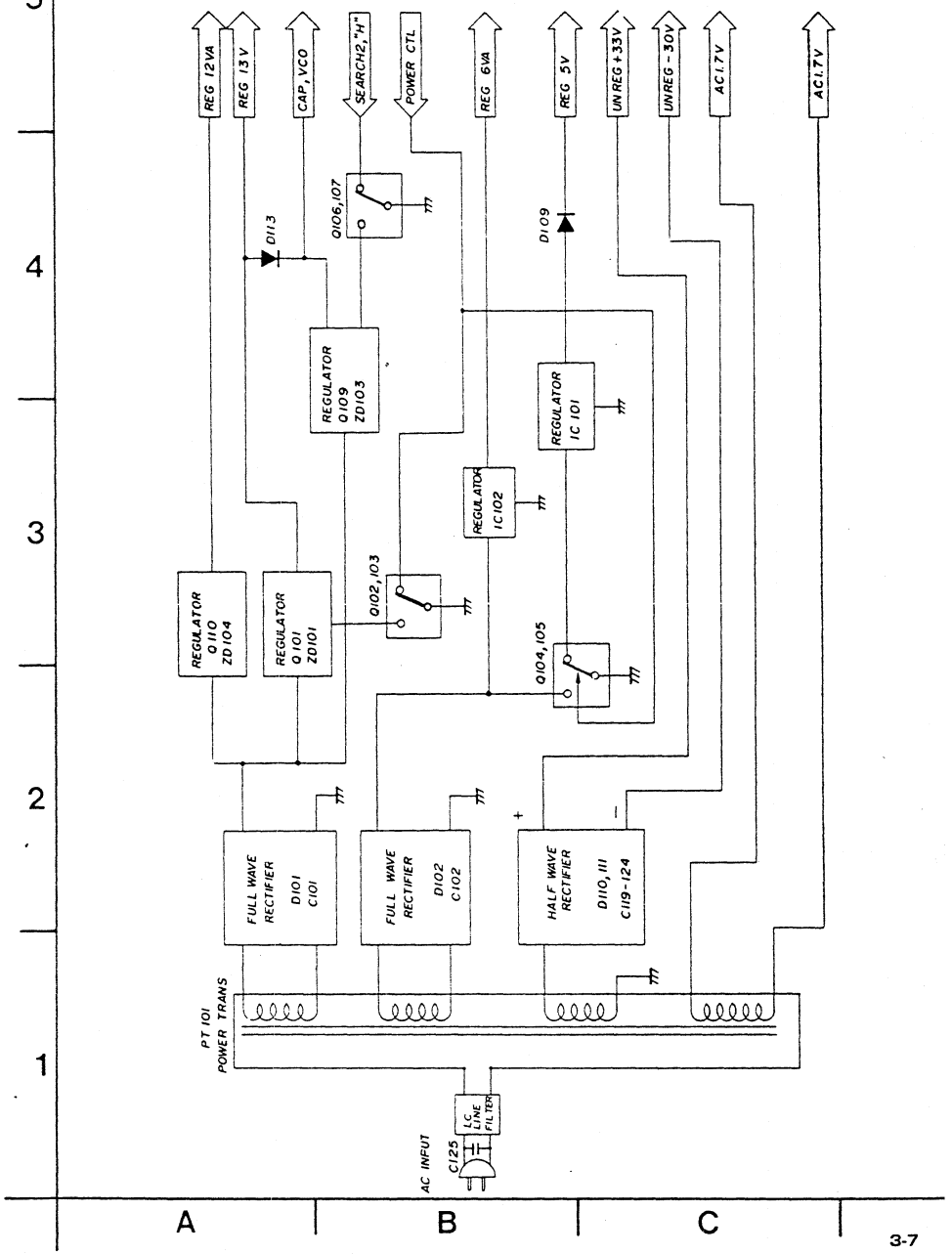
***Abbreviation**
- APC: Adjacent Picture Carrier
- SIF: Sound Intermediate Frequency
- CIF: Colour Intermediate Frequency
- CEN: Centre Frequency
- PIF: Picture Intermediate Frequency
- ASC: Adjacent Sound Carrier

Table 1 Frequency Table (MHz)

BROADCASTING SYSTEM	ADJUSTMENT MARKER FREQUENCY					
	APC	SIF	CIF	CEN	PIF	ASC
PAL, SECAM (B/G)	31.90	33.40	34.47	36.00	38.90	40.40

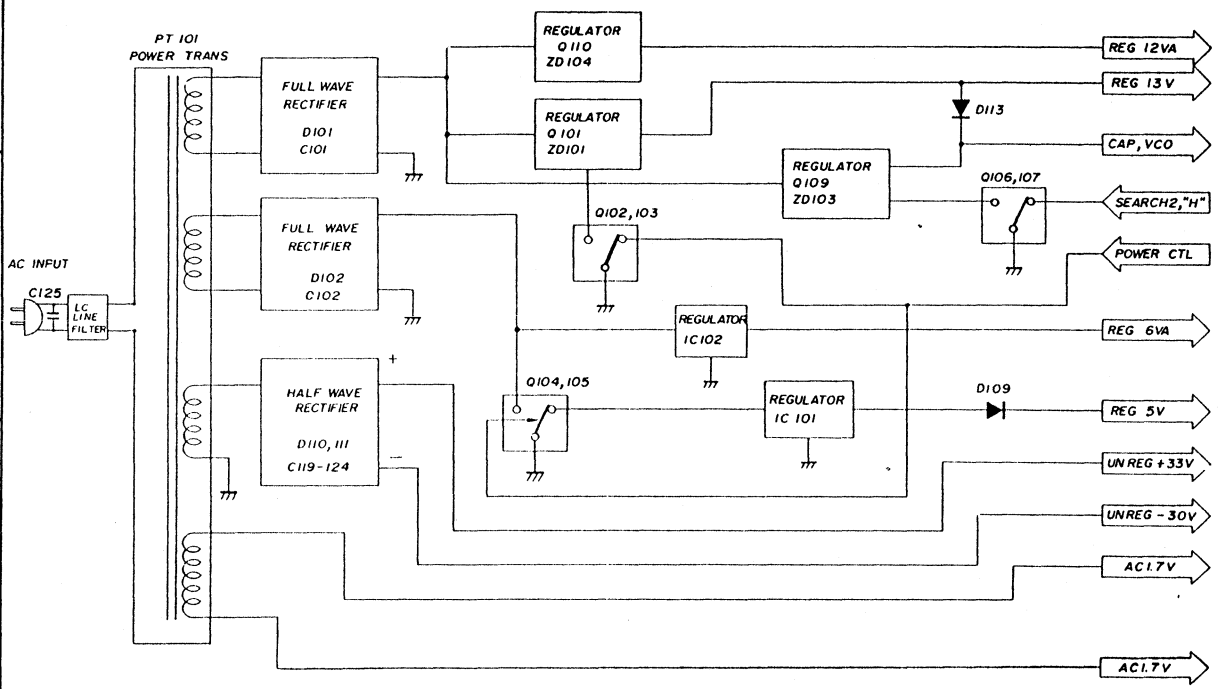
BLOCK DIAGRAMS

1. Power Block Diagram

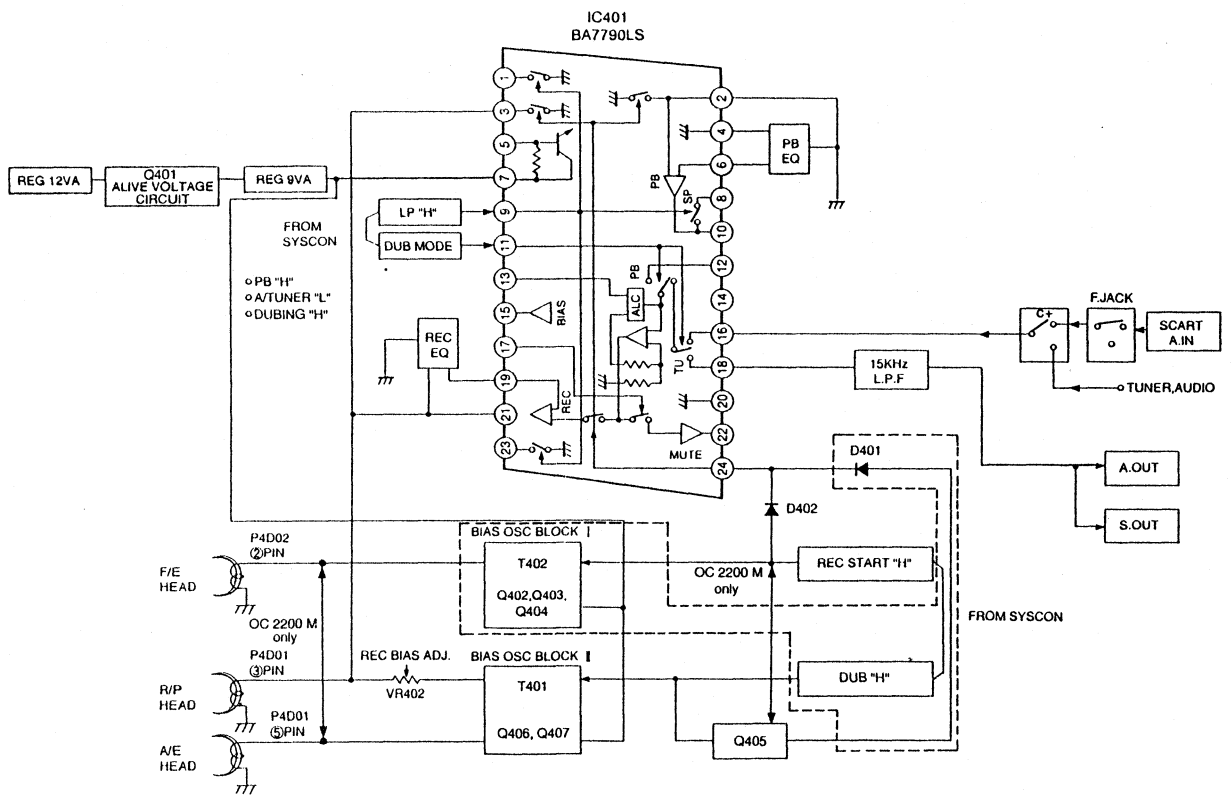


BLOCK DIAGRAMS

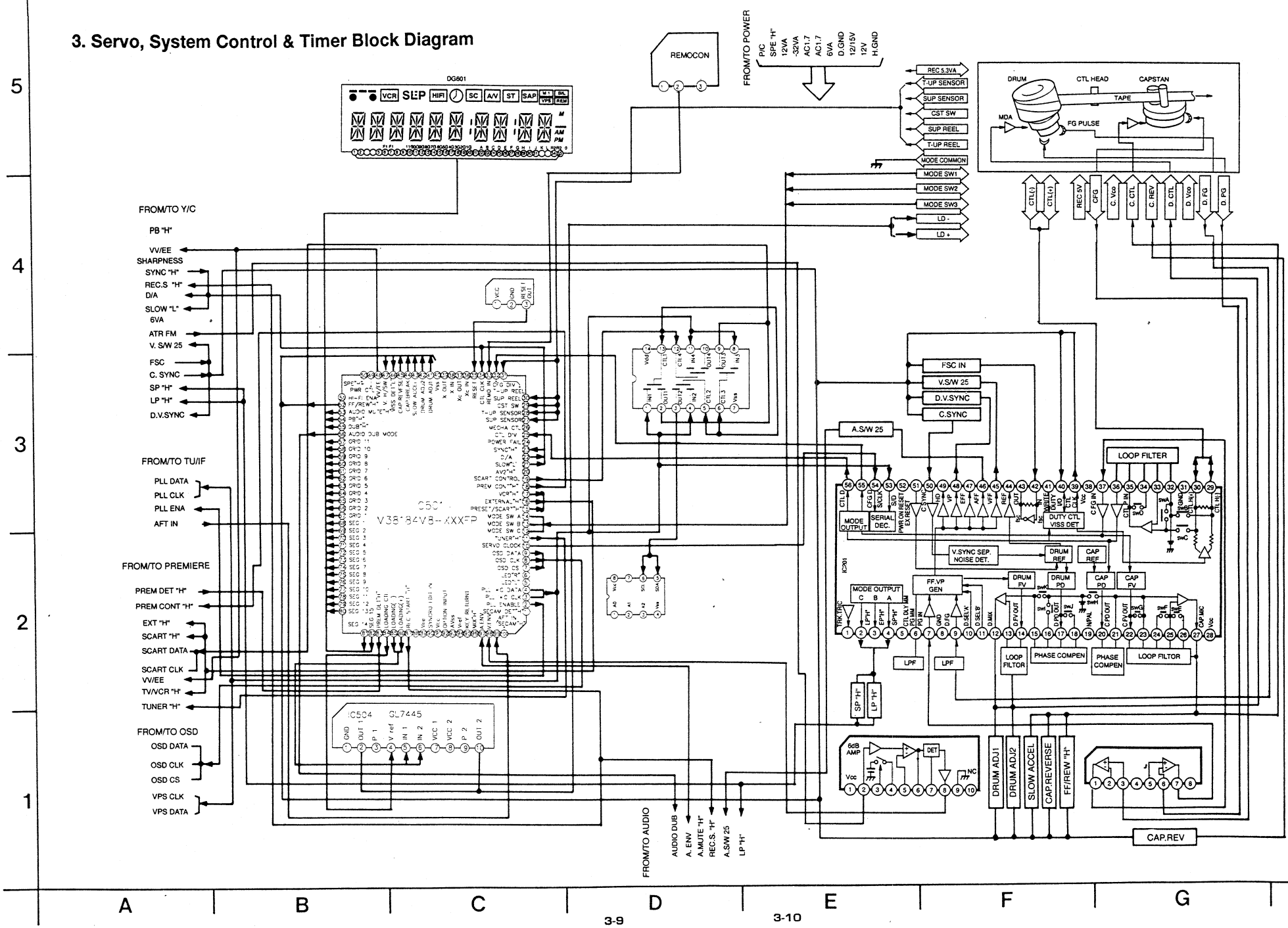
1. Power Block Diagram



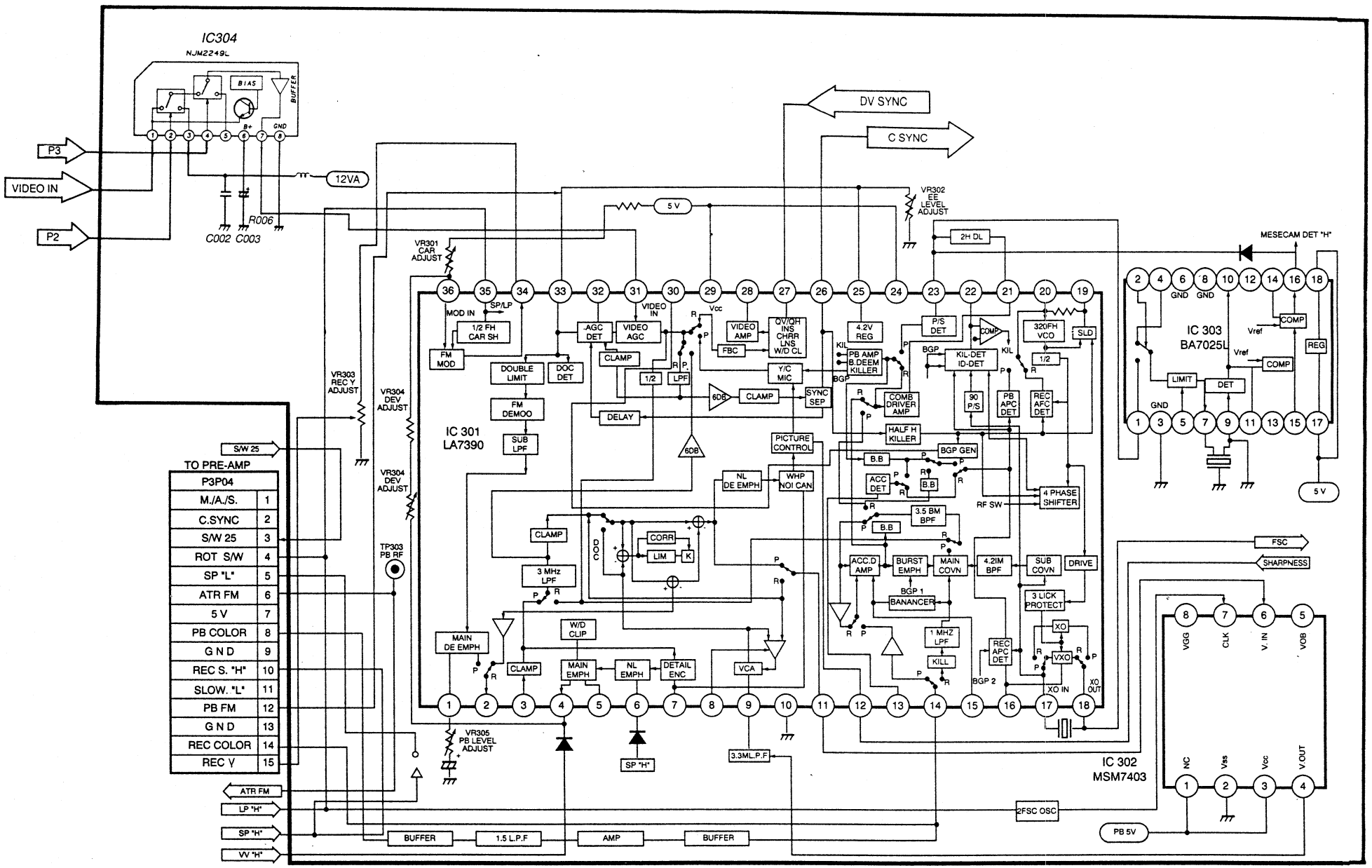
2. Audio Block Diagram



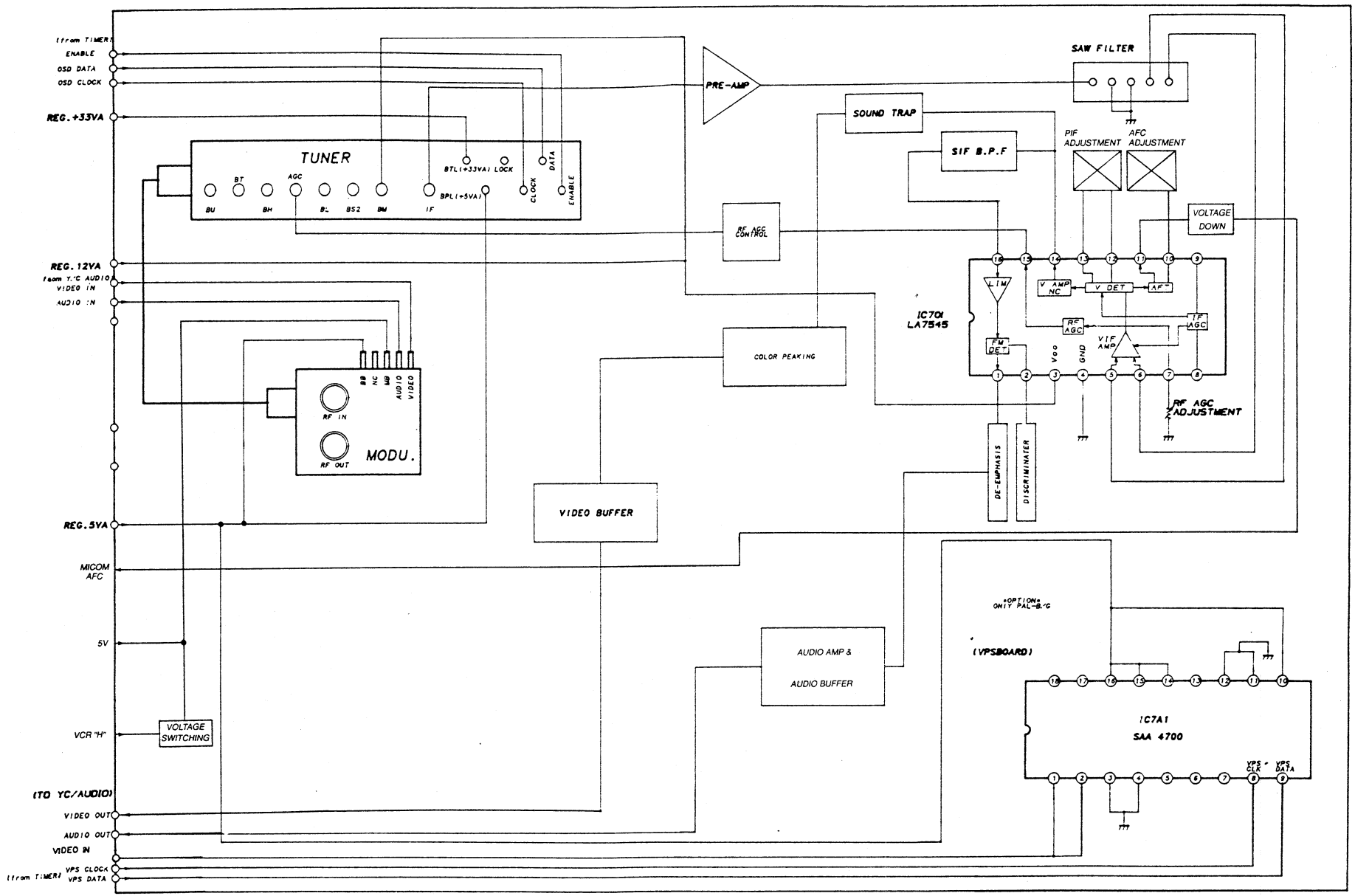
3. Servo, System Control & Timer Block Diagram



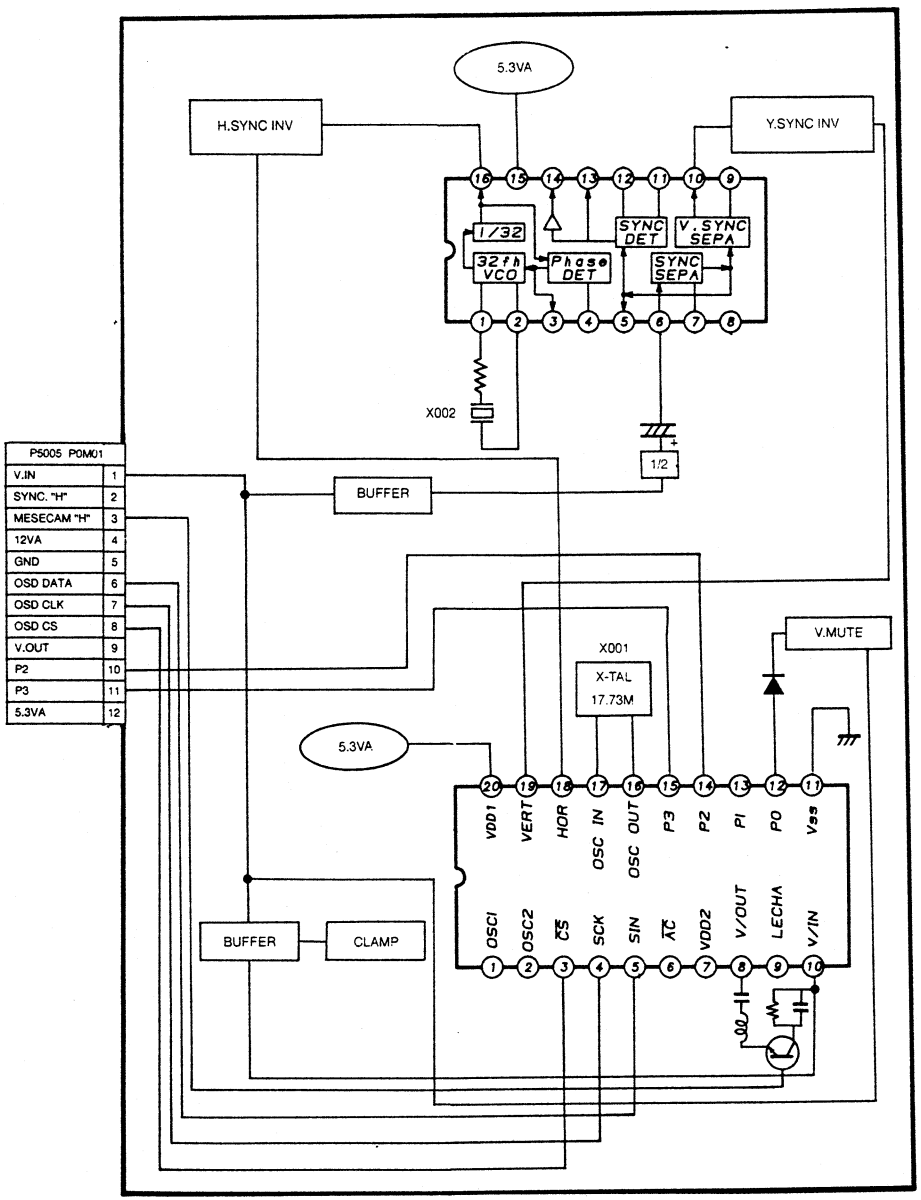
4. Y/C Block Diagram



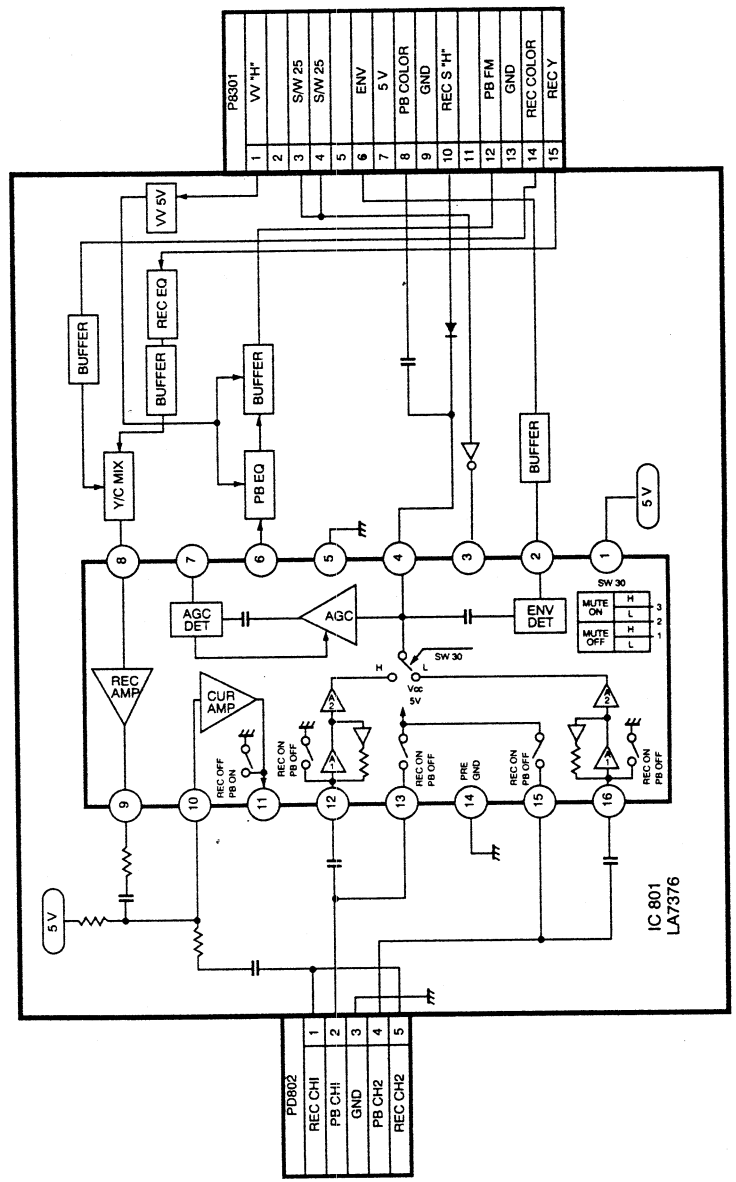
5. Tuner/IF & VPS Block Diagram



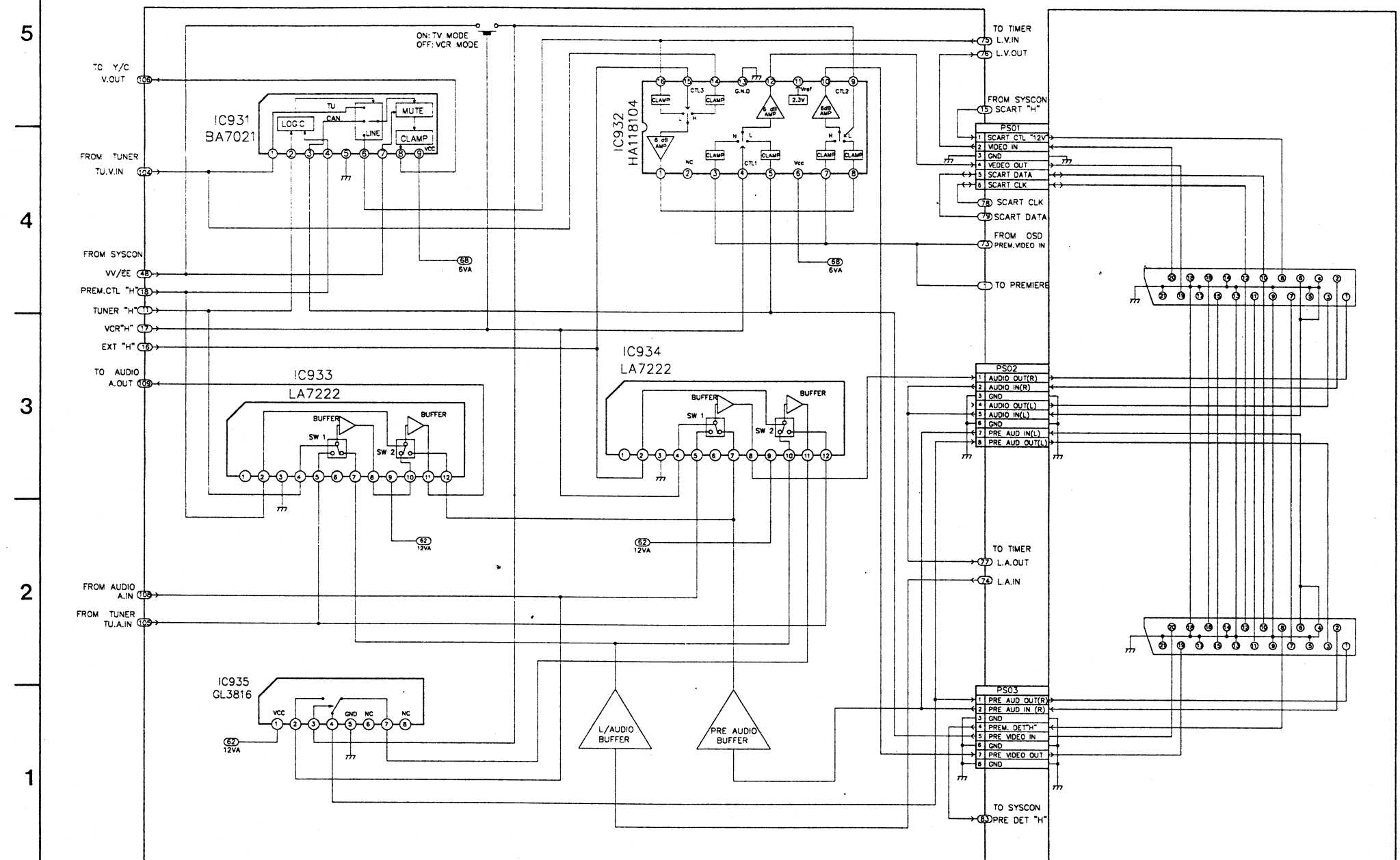
6. Function OSD Block Diagram



7. Pre-Amp Block Diagram

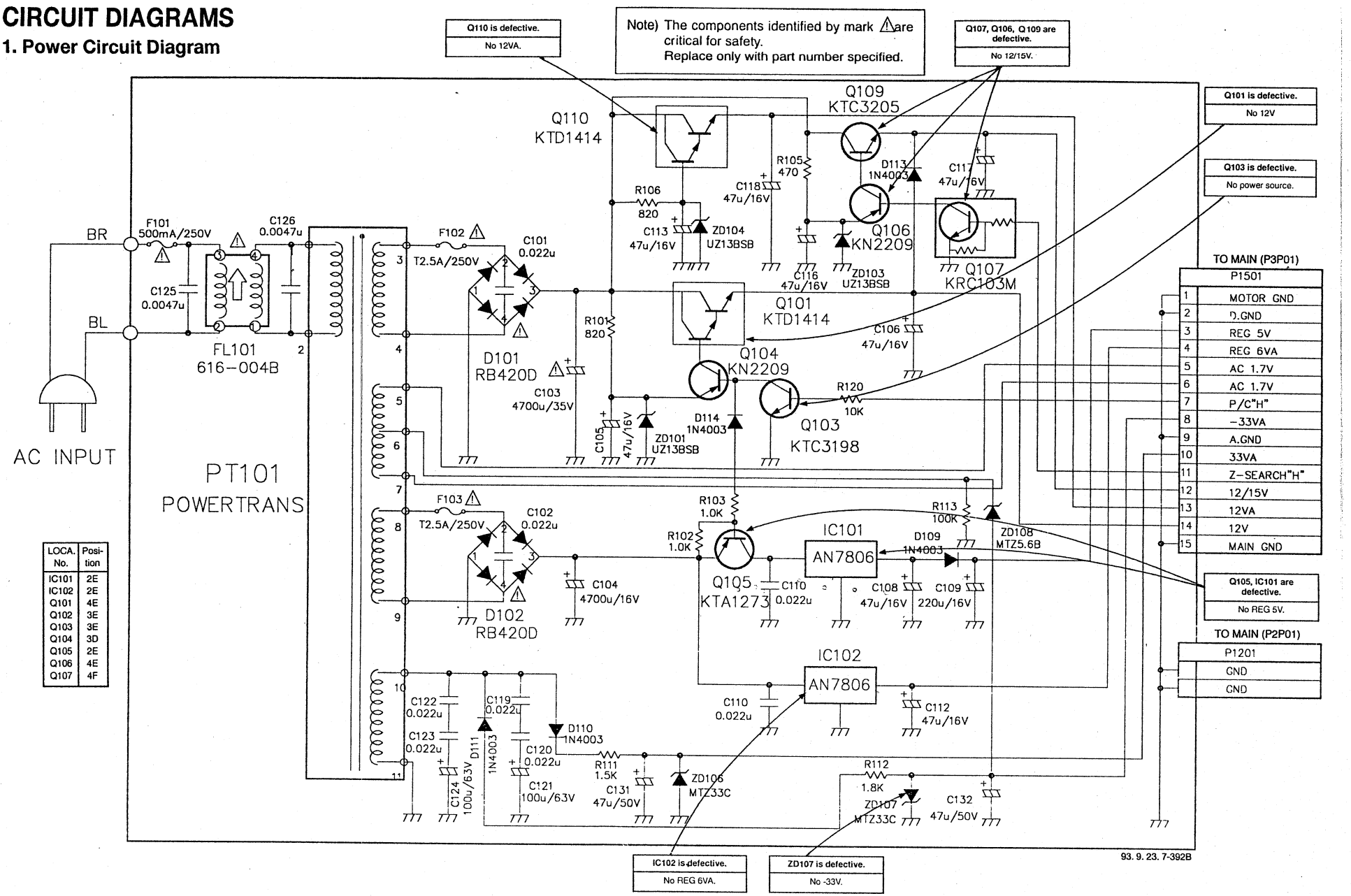


8. Premiere Block Diagram



CIRCUIT DIAGRAMS

1. Power Circuit Diagram

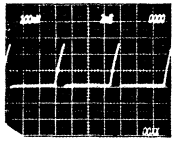


LOCA. No.	Posi-tion
IC101	2E
IC102	2E
Q101	4E
Q102	3E
Q103	3E
Q104	3D
Q105	2E
Q106	4E
Q107	4F

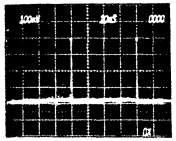
* Servo Waveform

①

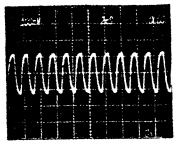
IC201 Pin ①
Tracking Trigger
(100mV/10msec)

② 

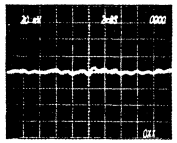
IC201 Pin ⑥
PG Mono-Multi
(100mV/2msec)

③ 

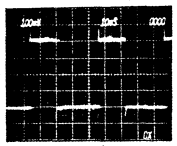
IC201 Pin ⑦ PG Input
(100mV/10msec)

④ 

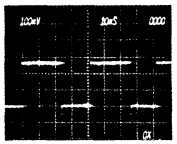
IC201 Pin ⑨ Drum
Frequency Generator
Input (100mV/2msec)

⑤ 

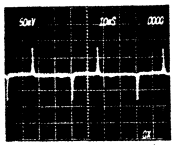
IC201 Pin ㉗ Capstan Control
(20mV/2msec)

⑥ 

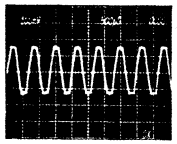
IC201 Pin ㉙
Record Control (-)
(100mV/10msec)

⑦ 

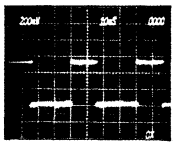
IC201 Pin ㉚
Record Control (+)
(100mV/10msec)

⑧ 

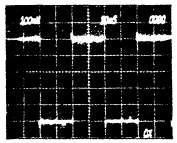
IC201 Pin ㉟
Playback Control Pulse
(50mV/10msec)

⑨ 

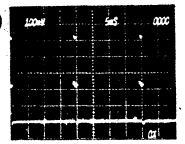
IC201 Pin ㊲
Capstan Frequency Generator
Input (100mV/500μ sec)

⑩ 

IC201 Pin ㊴ Control Clock
(200mV/10msec)

⑪ 

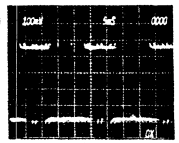
IC201 Pin ㊺
Video Head Switching
Pulse (100mV/10msec)

⑫ 

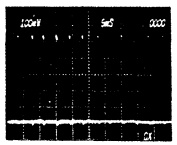
IC201 Pin ㊽ Vertical Pulse (VP)
(100mV/5msec)

⑬

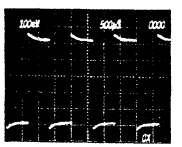
IC201 Pin ㊿ C-SYNC
Input terminal
(100mV/5msec)

⑭ 

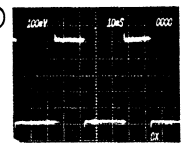
IC201 Pin ㊸
Servo Data Input terminal

⑮ 

IC201 PIN ㊹ Servo Clock Input
terminal (100mV/5msec)

⑯ 

IC201 Pin ㊺ CFG (Capstan
Frequency Generator) Count
Down Output terminal
(100mV/500μ sec)

⑰ 

IC201 Pin ㊻ Control Count Down
Output terminal.
(100mV/10msec)

• Servo TR Voltage Sheet

(PB/REC mode)

PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q201	5.02/5.02	1.16/1.16	4.94/4.95
Q202	5.02/5.02	1.15/1.15	4.94/4.95
Q203	5.02/5.02	2.67/2.66	4.97/4.95
Q204	0.01/0.01	2.70/2.68	0.04/0.04
Q205	0.01/0.01	5.02/5.02	0.01/0.01
Q207	4.94/2.38	4.61/2.38	5.01/4.39
Q208	2.51/2.50	2.41/2.41	0.01/0.01

• Servo IC Voltage Sheet

PB(REC)

1.91 (5.00)	2.50 (2.50)	0.78 (0.78)	0.82 (0.84)	3.80 (3.80)	5.03 (5.02)	0.50 (0.50)	0.01 (0.01)	0.04 (0.04)	2.51 (2.50)	2.51 (0.01)	2.51 (2.50)	2.58 (2.57)	2.59 (2.59)	2.60 (2.59)	0.01 (0.00)	5.00 (5.00)	1.90 (3.60)	5.03 (5.02)	2.66 (2.65)	2.50 (2.50)	2.51 (2.50)	2.51 (2.50)	2.51 (2.50)	2.51 (2.50)	0.01 (0.01)	2.51 (2.80)	2.51 (2.10)
55						50					45					40						35					30	

IC201(HD49756NT)

1				5					10					15					20					25			
3.60 (3.60)	0.00 (0.00)	0.00 (0.00)	4.97 (4.96)	0.01 (0.01)	0.28 (0.28)	2.06 (2.06)	0.01 (0.01)	2.59 (2.58)	2.64 (2.64)	2.64 (2.64)	1.27 (1.27)	2.50 (2.50)	2.52 (2.51)	2.52 (2.52)	2.52 (2.52)	2.52 (2.52)	2.52 (2.52)	2.39 (2.38)	0.01 (0.01)	2.53 (2.53)	2.53 (2.52)	2.52 (2.52)	2.52 (2.51)	2.52 (2.51)	2.51 (2.50)	2.63 (2.61)	2.66 (2.63)	5.02 (5.02)

PB(REC)

IC202(BA728N)

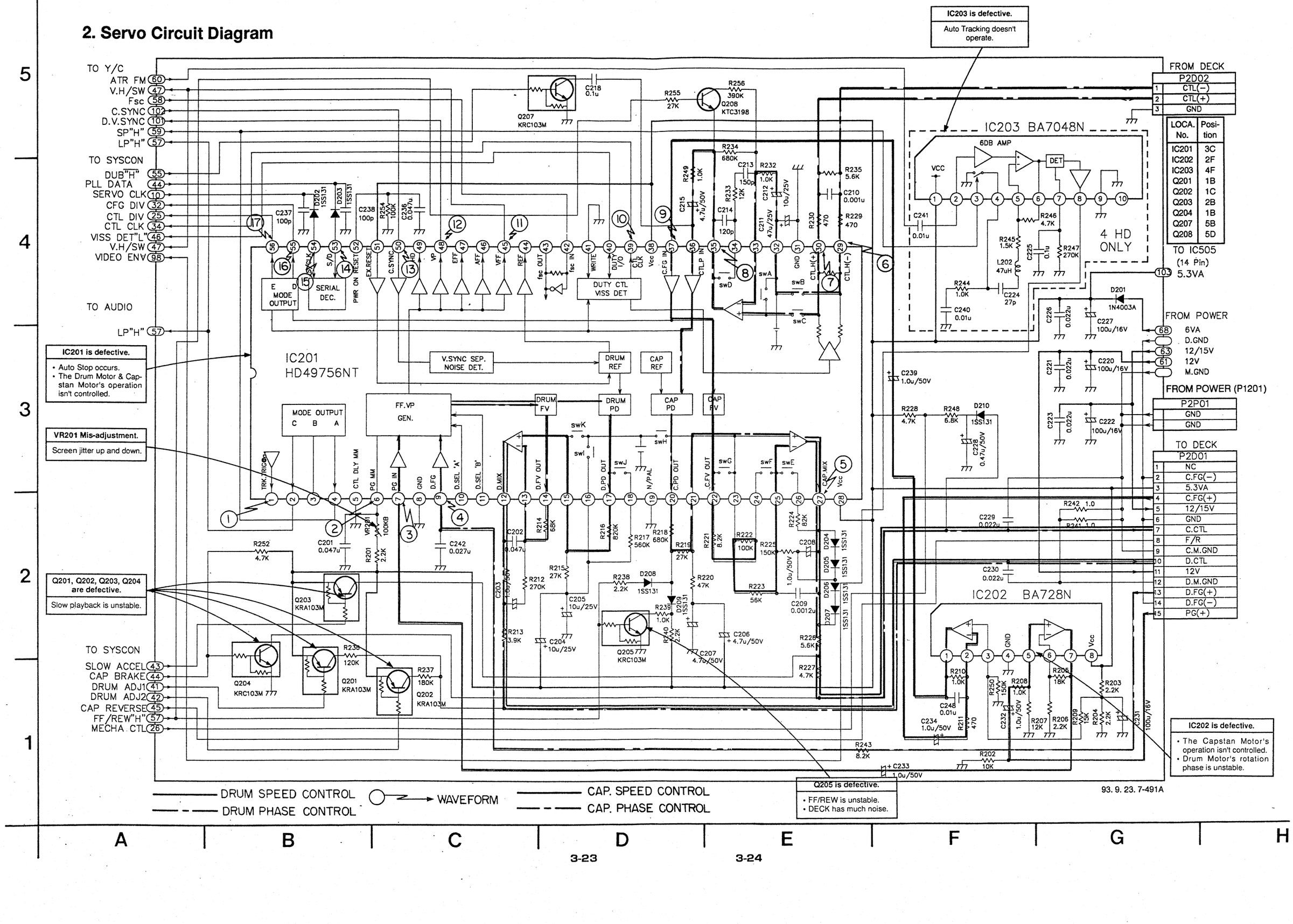
1				5			
2.27 (2.27)	2.27 (2.27)	2.26 (2.26)	0.01 (0.01)	0.01 (0.01)	0.00 (0.00)	0.09 (0.09)	5.02 (5.02)

PB(REC)

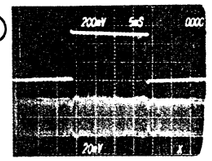
IC203(BA7048N)

1				5					10
5.02 (5.02)	1.64 (1.63)	4.97 (4.96)	0.00 (0.00)	2.47 (2.47)	2.47 (2.47)	0.82 (0.29)	1.51 (0.36)	0.01 (0.01)	0.01 (0.01)

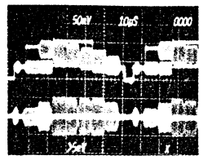
2. Servo Circuit Diagram



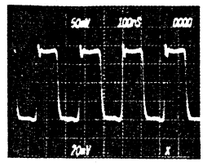
* Y/C Waveform (When taking a photograph of waveform, set probe of oscilloscope to 10:1)



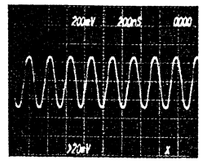
① P3P04 Pin ⑧
Playback RF (SP mode)
(20mV/5msec)



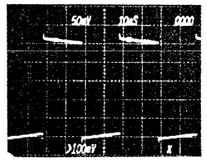
② IC301 Pin ⑭
Playback Color
(5mV/10μ sec)



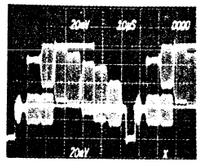
③ IC301 Pin ⑱
Playback Mode : Fsc
Oscillation (20mV/100nsec)



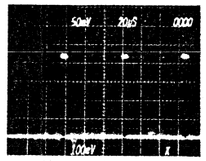
③ IC301 Pin ⑱
Record Mode:Fsc
Oscillation (20mV/200nsec)



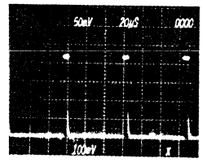
④ TP304
S/W 25 (100mV/10msec)



⑤ TP301 (W797)
Video Out terminal
(20mV/10μ sec)

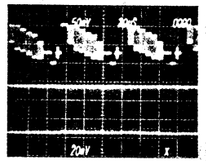


⑥ IC301 Pin ㉖
C.SYNC
(100mV/20μ sec)

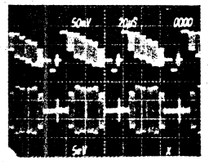


⑦ IC301 Pin ㉚
B.G.P Out terminal
(100mV/20μ sec)

⑧ IC301 Pin ③
Clamp input terminal
(20mV/ 20μ sec)



⑨ P3P04 Pin ⑮
Record FM signal
(20mV/20μ sec)



⑩ P3P04 Pin ⑭
Record Color Signal
(5mV/20μ sec)

⑪ IC303 Pin ⑨
Color Burst signal
(10mV/20μ sec)

* Y/C TR Voltage Sheet

(PB/REC mode)

Port / TR No.	Emitter	Collector	Base	Remark
Q301	5.02/0	0.07/0	4.99/0	SP mode
	5.01/0	4.97/0	0.02/0	LP mode
Q302	0/0	0/0	0/0	SP mode
	0/0	0/0	0/5.01	LP mode
Q303	0/0	0/0	4.96/0	
Q304	3.39/3.03	0/0	2.78/2.41	
Q305	4.0/3.64	0/0	3.4/3.03	
Q306	0/0	0/0	5.04/0	
Q307	0/0	4.55/4.54	0.12/0.11	
Q308	1.17/0	5.05/0	1.78/0	
Q309	2.79/0	5.03/0	3.40/0	
Q310	0.89/0	1.56/0	1.51/0	
Q311	0.95/0	5.03/0	1.56/0	
Q312	0/0	0/5.1	5.09/0	
Q313	5.11/5.1	5.05/0	4.32/5.1	
Q314	1.0/0.63	0/0	0.39/0	
Q315	2.01/0	0/0	1.38/0	
Q316	2.8/0	5.01/0	3.41/0	
Q321	0/0	0/0	5.01/5.01	SP mode
	0/0	5.11/5.1	0/0	LP mode

* Y/C IC Voltage Sheet

PAL mode — PB(REC)

2.38 (2.41)	0.63 (0.63)	3.63 (3.21)	3.37 (3.37)	1.44 (1.40)	3.21 (3.21)	0.57 (0)	4.96 (4.99)	2.05 (2.02)	0 (0)	0.53 (0.51)	4.19 (4.19)	4.96 (4.95)	1.96 (1.96)	1.98 (1.99)	2.69 (2.54)	3.20 (3.20)	3.19 (3.19)

2.45 : PB (2.44):(REC) MESECAM mode — 30 — 25 — PB : 3.94 (REC): (3.93) MESECAM mode — 20

IC 301 (LA7390)

1 — 5 — 10 — 15

2.32 (0)	2.79 (2.42)	2.48 (2.75)	4.44 (2.68)	4.43 (2.68)	4.50 (4.49)	2.39 (2.29)	3.16 (2.25)	2.13 (2.13)	0 (0)	2.05 (2.09)	2.51 (2.53)	1.73 (1.69)	2.96 (2.97)	2.27 (2.55)	2.18 (2.19)	3.65 (3.66)	2.55 (3.26)

PB(REC)

8.51 (0)	2.60 (0)	2.12 (0)	2.05 (0.2)

5

IC 302 (MSM7403)

1

5.01 (0)	0 (0)	5.01 (0)	3.42 (0)

PAL mode — PB(REC)

5.1 (5.09)	5.1 (5.09)	0 (0)	0 (0)	0 (0)	3.65 (3.76)	0 (0)	3.65 (3.76)	0 (0)

15 — 10

IC 303 (BA7025L)

1 — 5

3.7 (3.68)	0 (0)	0 (0)	3.7 (3.68)	4.56 (4.55)	0 (0)	4.54 (4.51)	0 (0)	3.1 (3.1)

MESECAM mode — PB(REC)

5.1 (5.09)	5.1 (5.09)	4.44 (4.43)	0 (0)	4.26 (4.26)	3.58 (3.59)	4.33 (4.32)	3.57 (3.57)	0 (0)

15 — 10

IC 303 (BA7025L)

1 — 5

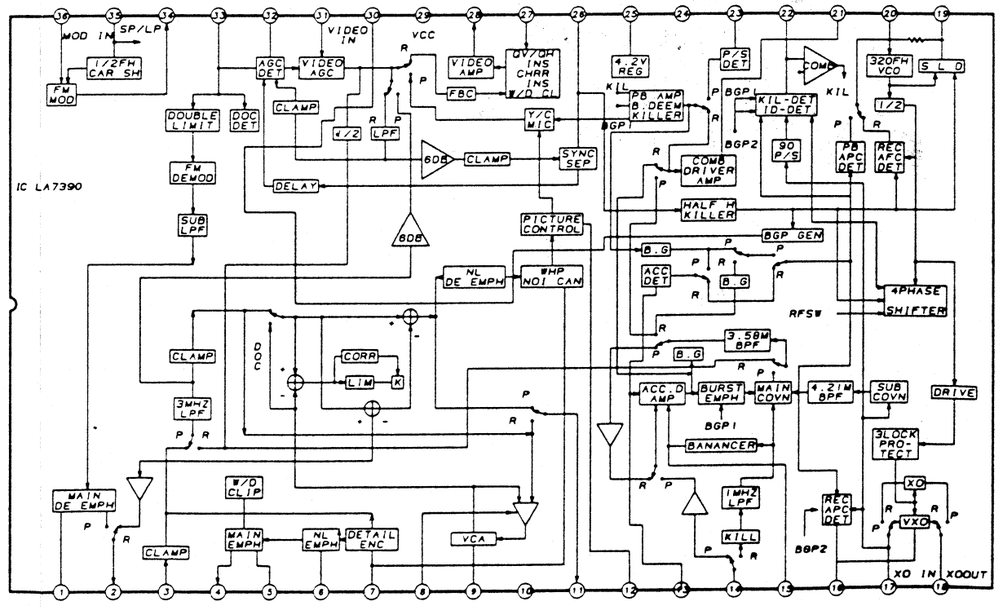
3.7 (3.69)	0 (0)	0 (0)	3.7 (3.69)	4.55 (4.54)	0 (0)	4.56 (4.54)	0 (0)	3.1 (3.1)

IC304(NJM2249L)

1 — 5

4.6	0.05	4.8	0.05	5.3	11.7	4.4	0

* IC301 (LA7390) Block Diagram



3. Y/C Circuit Diagram

IC304 is defective.
Title Recording is failed or Video Inputting is failed.

Q304, Q305 are defective.
Video out is bad or doesn't appear in the PB mode.

Q309, Q310, Q311 are defective.
Video color signal doesn't appear in the PB mode.

Q308, Q315, Q316 are defective.
Drop-out compansation is failed.

DL301 is defective.
PB color signal is unstable.

Z301, L319 are defective.
MESECAM color signal doesn't appear.

X301 is defective.
Video out color signal doesn't appear & drum speed control is filed.

TO PRE-AMP (P8301)

LOCA. No.	Position
IC301	3E
IC302	2F
IC304	4B
Q302	3G
Q307	3G
Q303	4G
Q304	2D
Q305	2E
Q306	2E
Q307	3G
Q308	2F
Q309	2D
Q310	1E
Q311	2E
Q312	1D
Q313	1D
Q314	1B
Q315	1E
Q316	1F
Q321	1B

PB Y SIGNAL — REC Y SIGNAL
PB C SIGNAL — REC C SIGNAL

2500 M ONLY

2200 M ONLY

93. 9. 23. 7-485A

4. Audio & Function OSD Circuit Diagram

Q407, Q406 Short.
Audio signal will not be recorded.

Q402 Short.
The defect in the Full Erase head (REC mode).

Q401, ZD401 Short.
No Audio signal or Tuner Audio overamplify.

VR401 Mis-Adjustment
Audio distortion will be occured.

Q008 is defective.
SYNC detect is failed.

X001 is defective.
F. OSD screen doesn't appear.

Q405 Short.
Audio dubbing is failed.

Q403, Q404 Short.
The defect in the Full Erase head (REC mode).

Q001 is defective.
Y/C out CVS doesn't appear.

L002 is defective.
F.OSD character position shift.

AUDIO/OSD MODULE

MAIN

AUDIO/OSD MODULE

IC401 BA7790LS

FL401 LPF12KHz

IC902 NJM2229S

IC901 M35010

T401 BIAS-OSC

T402 BIAS-OSC

REC BIAS ADJ.

AUDIO DUBBING

CONNECT TO R/P HEAD

P4D01: PB. AUDIO / G N D / REC. AUDIO / G N D / AUDIO ERASE

P4M01 P4V01: AUDIO IN / AUDIO OUT / G N D / REC.START "H" / DUB "H" / G N D / MUTE "H" / DUB MODE / LP "H" / G N D / REC BIAS / REC BIAS "+" / G N D / G N D / 12VA

P5005 P0V01: V.IN / SYNC "H" / MESECAM "H" / 12VA / GND / OSD DATA / OSD CLK / OSD CS / V.OUT / P2 / P3 / 5.3VA

P4002: G N D / FULL ERASE

FROM SYS. DUB MODE, A.MUTE"H", DUB"H", REC.START"H", TO PREM. A.OUT, A.IN, 5.3VA, 12VA, LP"H"

FROM SYS. OSD CLOCK, OSD DATA, OSD CS, SYNC"H", TO PREM. V.OUT, FROM Y/C V.IN, P2, P3, MESECAM"H"

Q401 KTC3205 / Q404 KTC3205 / Q407 KTC3205 / Q008 KTC3198 / Q002 KTC3199 / Q004 KTC3199 / Q005 KTC3199 / Q007 KTC3199 / Q003 KTC3198 / Q001 KTA1267 / Q012 KRA103V / Q011 KRA103V / Q013 KRC103V / Q014 KRC103V / Q006 KRC103M / Q010 KRC103M / Q402 KRC103M / Q403 KRC103M / Q406 KRC103M / Q405 KRC103M

X002 CSB500F

D004 1SS131 / D401 1SS131 / D402 1SS131 / D002 1SS131 / D303 1SS131 / D006 1SS131

ZD401 MTZ10B

W408 2200M / 2500M

220KB

PB MODE

REC/EE MODE

CVS IN

TITLE WHITE/BLACK SWITCHING PULSE

CVS OUT/F OSD BLUE SIGNAL

2500 M ONLY

2200 M ONLY

93. 9. 23. 7-486A

* Audio TR Voltage Sheet

PB/REC [DUB]

PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q401	9.1/9.1	12.0/12.0	9.9/9.9
Q402	0.0/0.0 [0.0]	6.4/0.0 [6.4]	0.0/5.0 [0.0]
Q403	0.0/0.0 [0.0]	0.0/0.5 [0.0]	6.4/0.0 [6.4]
Q404	0.0/0.5 [0.0]	9.1/8.5 [9.1]	0.0/0.5 [0.0]
Q405	0.0/0.0 [0.0]	6.3/0.0 [0.0]	0.0/5.0 [5.0]
Q406	0.0/0.0 [0.0]	0.0/0.5 [0.5]	5.4/0.0 [0.0]
Q407	0.0/0.5 [0.5]	9.1/8.5 [8.5]	0.0/0.5 [0.5]

* Audio IC Voltage Sheet

PB(REC)[DUB]

[4.8]	[0.0]	[4.0]	[4.2]	[0.0]	[4.2]	[4.1]	[1.2]	[4.1]	[4.2]	[0.5]	[2.8]
1.0 (4.8)	0.0 (0.0)	4.0 (4.0)	4.2 (4.2)	0.0 (0.0)	4.2 (4.2)	4.1 (4.1)	1.2 (1.2)	1.1 (4.1)	4.2 (4.2)	0.0 (0.5)	2.8 (2.8)
20									15		
IC401(BA7790LS)											
1				5					10		
0.0 (0.0)	3.4 (3.4)	0.0 (0.0)	0 (0.0)	9.0 (9.0)	3.4 (3.4)	9.1 (9.1)	3.6 (3.6)	0.0 (0.0)	3.6 (3.6)	5.0 (0.0)	4.1 (4.1)
[0.0]	[3.4]	[0.0]	[0.0]	[9.0]	[3.4]	[9.1]	[3.6]	[0.0]	[3.6]	[0.0]	[4.1]

A B C D E F G H

5. Timer Circuit Diagram

• Timer TR Voltage Sheet

(PB/REC mode)

PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q601	0.01/0.01	0.08/0.08	2.78/2.78
Q602	0.00/0.01	5.05/5.05	0.01/0.01

DG601 is defective.
- Digitron don't display or is unstable.
- The Digitron's light is dim.

OPTION TABLE

	OC2200M	OC2500M
D601	Y	N
D602	Y	Y
D603	Y	N
D604	N	N
D605	Y	Y
D606	N	N
D607	N	N
L602	N	Y
JK602	N	Y
JK603	N	Y
ZD603	N	Y
ZD604	N	Y
ZD605	N	Y
ZD606	N	Y

TIMER

DG601
DIGITRON

TO MAIN (P5602)

P6502	
1	P3
2	P4
3	P5
4	P6
5	P7
6	P8
7	P9
8	P10
9	P11
10	P12
11	P13
12	REMOCON
13	P14
14	P15
15	C.PAUSE
16	GND
17	OPTION IN
18	KEY RETURN
19	Vref

TO MAIN (P5601)

P6501	
1	SHARPNESS
2	TV CNTROL
3	6VA
4	GND
5	AC 1.7V
6	AC 1.7V
7	11G
8	10G
9	9G
10	8G
11	7G
12	6G
13	5G
14	4G
15	3G
16	2G
17	1G
18	P1
19	P2

P6503	
GND	1
AUDIO(F-M)	2
GND	3
VIDEO(F-M)	4
GND	5
VIDEO(M-F)	6
GND	7
AUDIO(M-F)	8
GND	9
GND	10
GND	11

4HD ONLY

P6504 P6605	
GND	8
KEY1	7
VREF	6
KEY RETURN	5
NC	4
TV CONTROL	3
VCR CONTROL	2
GND	1

KEY - BOARD

RC601, Q601, Q602 are defective.
Remocon doesn't operate.

93. 9. 23. 7-492A

6. System Control Circuit Diagram

Q507, Q508 are defective.
TV control or SCART control is unstable.

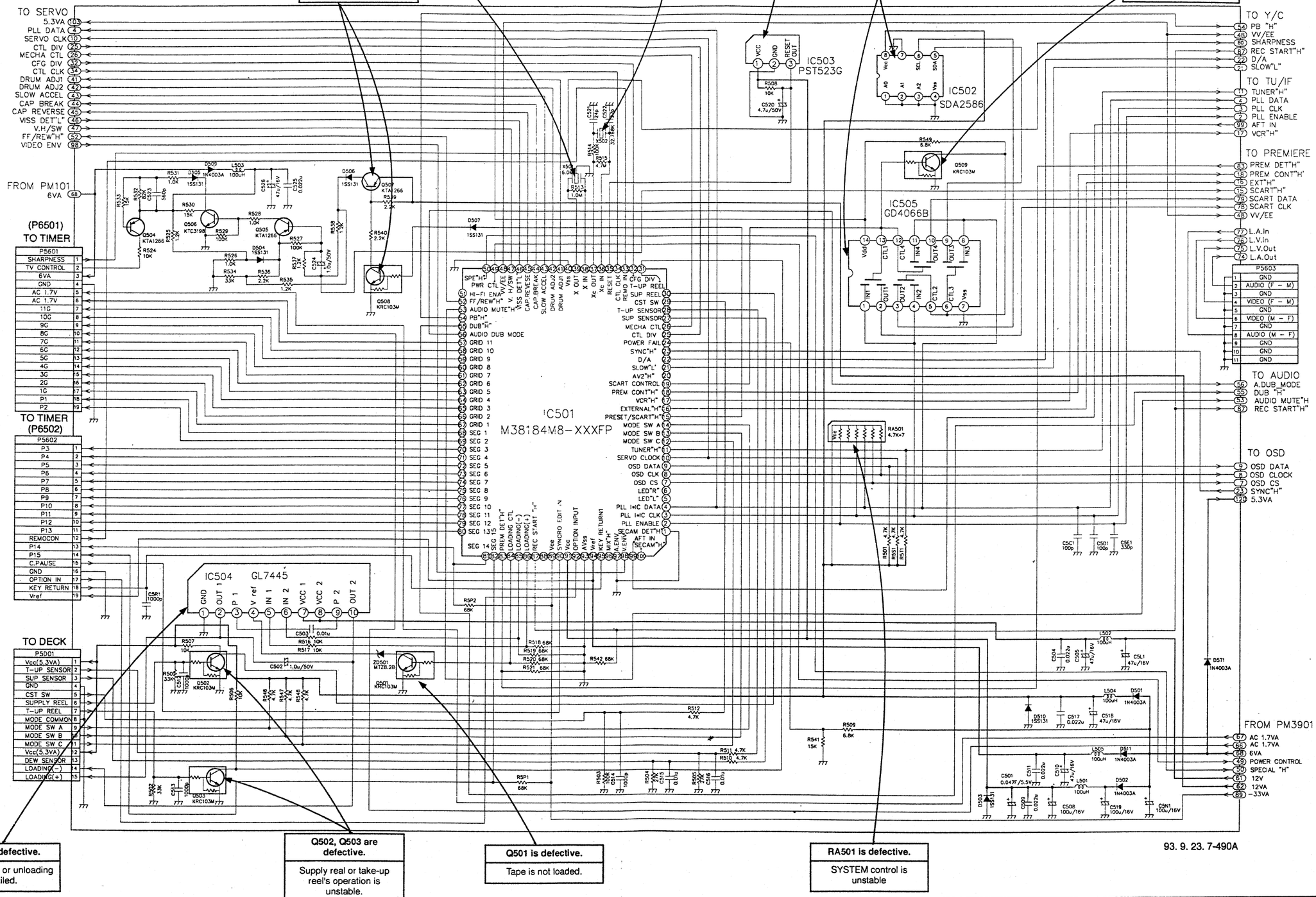
X501 is defective.
- Digitron doesn't operate.
- SYSTEM control is unstable.

X502 is defective.
Clock doesn't operate.

IC503 is defective.
Reset doesn't operate.

IC502, IC505 are defective.
Memory of CH is unstable.

Q509 is defective.
CH-programmer is unstable.



IC504 is defective.
Tape loading or unloading is failed.

Q502, Q503 are defective.
Supply real or take-up reel's operation is unstable.

Q501 is defective.
Tape is not loaded.

RA501 is defective.
SYSTEM control is unstable

93. 9. 23. 7-490A

* System Control TR Voltage Sheet

(PB/REC mode)

PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q501	0.00/0.00	0.01/0.01	4.96/4.96
Q502	0.00/0.00	PULSE/PULSE	PULSE/PULSE
Q503	0.00/0.00	PULSE/PULSE	PULSE/PULSE
Q504	5.16/5.16	0.01/0.01	5.11/5.11
Q505	10.69/10.66	0.01/0.01	11.01/10.98
Q506	0.01/0.01	5.15/5.15	0.01/0.01
Q507	11.96/11.93	11.95/11.91	11.20/11.16
Q508	0.01/0.01	0.05/0.05	4.43/4.43
Q509	0.00/0.00	4.87/4.84	0.01/0.05

* System Control IC Voltage Sheet

PB(REC)

4.88 (4.84)	0.08 (0.08)	0.27 (0.31)	0.28 (0.34)

8 IC502 (SDA2586) 5

1 4

0.00 (0.00)	0.00 (0.00)	0.01 (0.00)	0.00 (0.00)

PB(REC)

IC503 (PST523G)

1 3

4.98 (4.98)	0 (0)	4.98 (4.98)

PB(REC)

4.87 (4.85)	0.02 (0.05)	0.02 (0.05)	0.28 (0.33)	0.93 (0.81)	0.28 (0.33)	0.28 (0.35)

14 IC505(GD4066B) 10

1 5

0.28 (0.33)	0.93 (0.83)	0.28 (0.33)	0.68 (0.33)	4.87 (4.84)	4.87 (4.84)	0.00 (0.01)

PB(REC)

IC504(GL7445)

1 5 10

0.00 (0.00)	0.58 (0.56)	0.80 (0.78)	0.64 (0.59)	1.78 (1.77)	1.79 (1.78)	12.8 (12.82)	12.82 (12.82)	0.80 (0.80)	0.58 (0.57)

PB(REC)

	0.0 (0.01)	4.86 (4.93)	4.83 (0.00)	2.50 (2.55)	4.91 (5.00)	0.01 (0.01)	0.04 (0.03)	4.90 (4.95)	4.50 (4.95)	4.88 (4.50)	0.00 (0.01)	2.34 (2.12)	2.22 (2.02)	2.40 (2.16)	2.12 (1.72)	4.90 (4.53)	2.00 (4.00)	4.96 (4.92)	2.47 (2.44)	PULSE PULSE	
0.40 (0.38)	50					45				40					35				31	30	PULSE PULSE
0.00 (0.00)	51																				0.00 (0.00)
0.00 (0.00)																					0.17 (0.16)
4.88 (0.00)																					0.00 (0.00)
0.00 (0.00)	55																				4.90 (4.53)
4.88 (0.00)																				25	1.97 (4.87)
-23.2 (-25.2)																					3.89 (3.85)
-22.1 (-25.3)																					4.07 (4.01)
-21.1 (-25.3)																					4.90 (4.52)
-22.0 (-25.3)	60																				4.90 (4.52)
-21.9 (-25.3)																				20	0.03 (0.06)
-22.0 (-25.3)																					0.04 (0.06)
-22.0 (-25.3)																					0.04 (0.06)
-22.0 (-25.3)																					4.88 (4.50)
-22.0 (-25.3)	65																				4.89 (4.51)
-22.1 (-25.3)																				15	4.89 (4.51)
-21.9 (-25.3)																					0.00 (0.00)
-13.3 (-14.8)																					0.00 (0.00)
-24.0 (-25.7)																					0.00 (0.00)
-24.0 (-27.0)	70																				4.88 (4.51)
-22.0 (-24.0)																				10	0.25 (0.28)
-10.0 (-20.0)																					4.74 (4.68)
-8.4 (-14.5)																					4.74 (4.68)
-20.3 (-25.0)																					4.74 (4.69)
-17.1 (-22.3)	75																				0.06 (0.08)
-24.0 (-27.6)																				5	0.06 (0.08)
-24.3 (-22.4)																					0.41 (0.50)
-24.3 (-27.6)																					0.39 (0.45)
-13.6 (-17.2)																					0.24 (0.25)
-23.3 (-27.6)	80	81				85				90					95				1	100	0.00 (0.00)
	-7.30 (-9.50)	-9.80 (-12.0)	0.00 (0.00)	0.00 (0.00)	-4.89 (4.96)	4.89 (4.96)	0.01 (4.93)	0.00 (0.00)	-28.9 (-27.9)	0.55 (0.55)	4.54 (4.98)	1.74 (0.20)	0.00 (0.00)	5.12 (5.27)	5.01 (5.26)	0.90 (0.04)	0.00 (0.00)	3.56 (0.37)	4.01 (1.80)	4.53 (4.97)	

IC501
M38184M8-XXFP

* Premiere TR Voltage Sheet

PORT / TR. NO	EMITTER	COLLECTOR	BASE
Q936	5	5.6	12
Q937	5	5.4	12

* Premiere IC Voltage Sheet

IC931(BA7021)

1 5

0	4.1	2.5	0	0	2.5	0	1.5	5.6

PB(REC)

1.8	4.5	2.1	0	2.8	2.3	2.7	0

15 IC932(HA118104) 10

1 5

2.5	0	2.2	4.5	1.9	5.6	2.5	2.1

IC933(LA7222)

1 5 10

0	0	0	4.2	8	0	8	7.4	12	8	7.4	8

IC934(LA7222)

1 5 10

0	4.5	0	4.5	8	0	8	7.2	12	8	7.4	8

IC935(GL3816)

1 5

12	8	0	7.2	0	0	7.8	0

7. Premiere Circuit Diagram

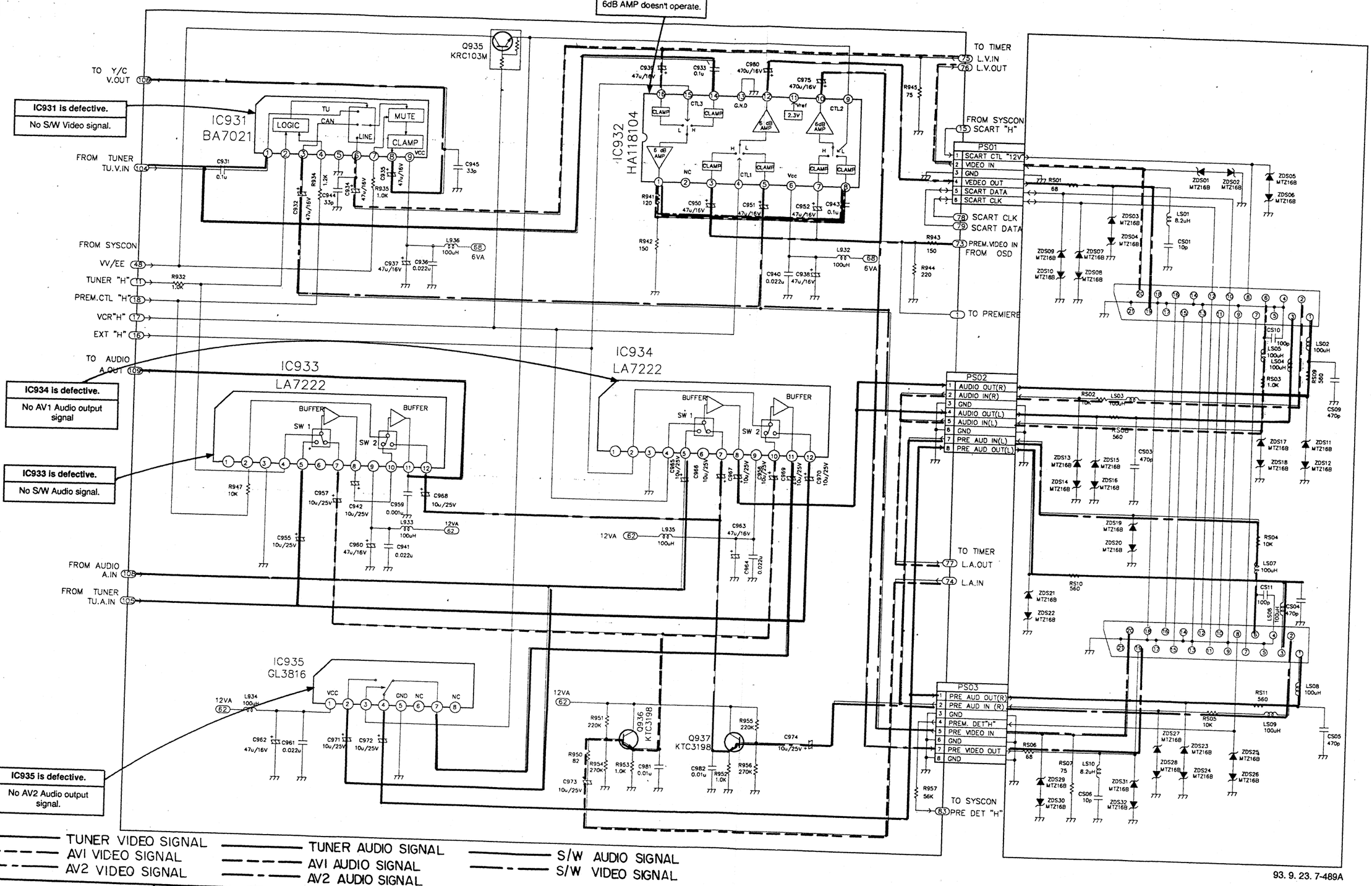
IC932 is defective.
6dB AMP doesn't operate.

IC931 is defective.
No S/W Video signal.

IC934 is defective.
No AV1 Audio output signal

IC933 is defective.
No S/W Audio signal.

IC935 is defective.
No AV2 Audio output signal.



93. 9. 23. 7-489A

8. Tuner/IF & VPS Circuit Diagram

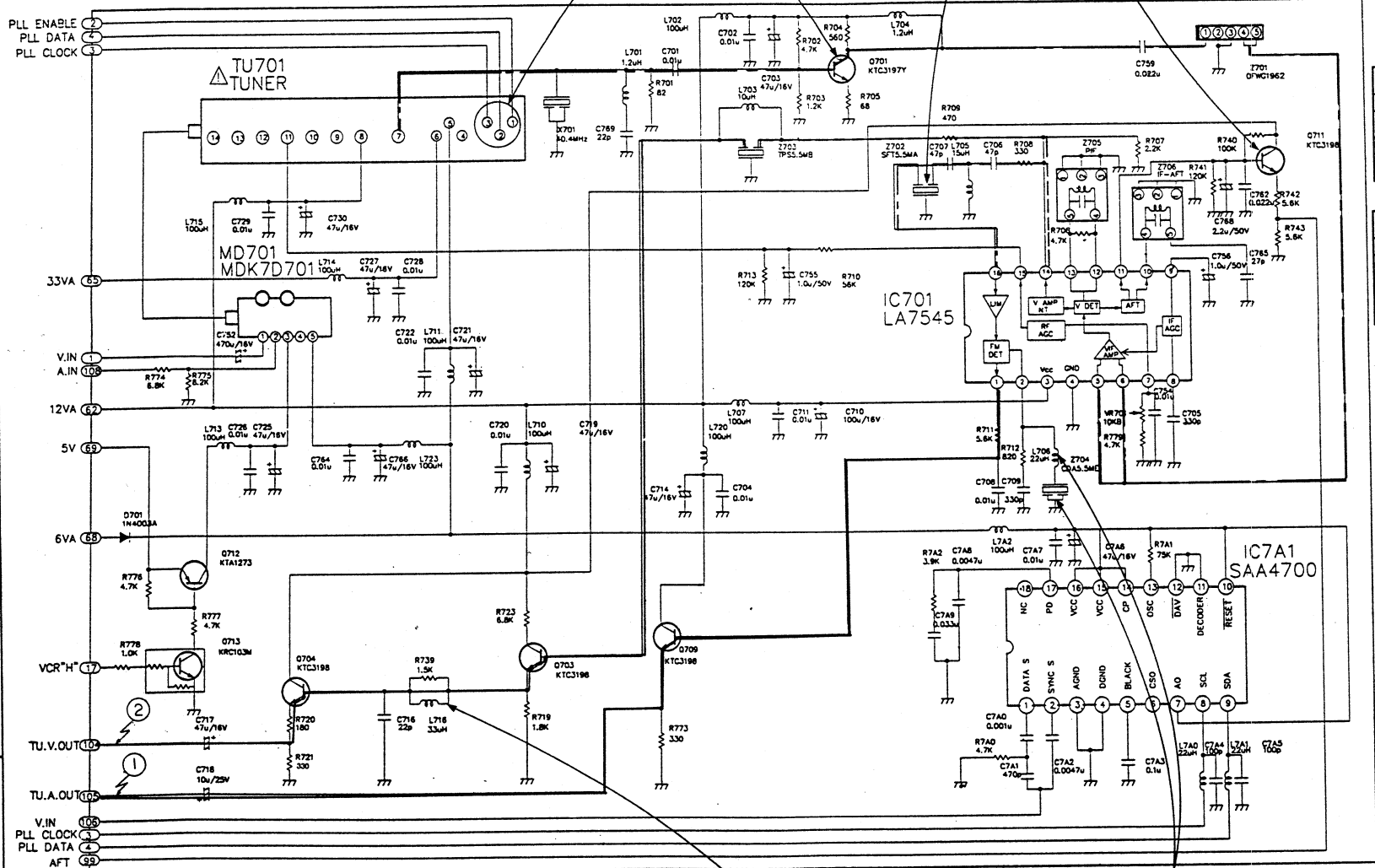
NOTE: 1. The components identified by mark ⚠ are critical for safety.
Replace only with part number specified.

TU701 Pin ①, ②, ③ are defective. (Clock, Data, Enable)
No Picture. (No VIF)

Q701 is defective.
The brightness of picture is dim.
←VIF Level not controlled.

Z702 is defective.
No Audio signal. (No SIF)

Q711 is defective.
Tuning (Band Selection) is failed.
←AFC Voltage not controlled.



R739, L706 are defective.
The brightness of picture is dim.
←Color peacking is failed.

L706, Z704 are defective.
No Audio signal (FM→AM switching is failed).

VIDEO SIGNAL
SIF SIGNAL
VIDEO+SIF SIGNAL
WAVEFORM
AUDIO SIGNAL
VIF SIGNAL

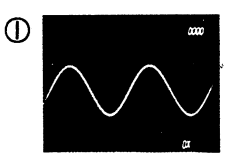
PB(REC)

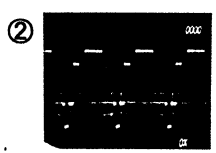
1.8	6.0	4.7	6.6	6.6	5.3	9.5	9.8
15						10	
IC701(LA7545)							
1				5			
5.4	4.9	11.1	0	4.4	4.4	3.17	9.18

PB(REC)

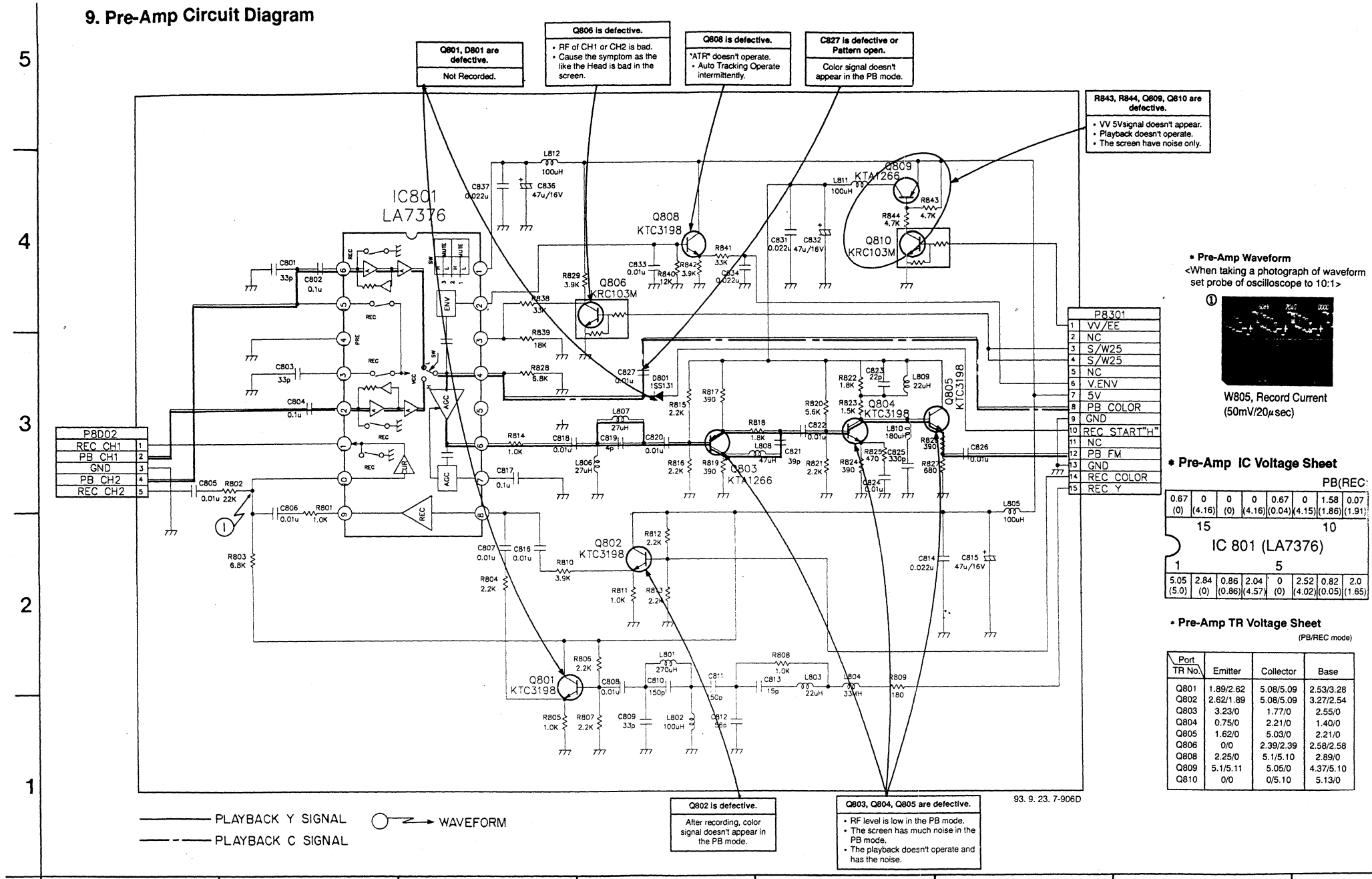
2.4	2.4	0	0	4.6	0.8	0	0	4.61
15							10	
IC7A1(SAA4700)								
1				5				
2.4	2.4	0	0	4.4	0.36	4.61	0.4	0.5

PORT / TR. NO.	EMITTER	COLLECTOR	BASE
Q701	1.5	12	2.3
Q703	3.6	3.7	4.3
Q704	3	12	3.7
Q709	4.9	12	5.5
Q711	4.8	12	5.3
Q712	4.9	4.9	4.3
Q713	0	0	4.6

①

AUDIO OUT
0.2V/0.2mS EE

②

VIDEO OUT
0.2V/10μS EE

9. Pre-Amp Circuit Diagram



*** Pre-Amp Waveform**

<When taking a photograph of waveform set probe of oscilloscope to 10:1>

W805, Record Current (50mV/20μsec)

*** Pre-Amp IC Voltage Sheet**

PB(REC

0.67 (0)	0 (4.16)	0 (0)	0 (4.16)	0.67 (0.04)	0 (4.15)	1.58 (1.86)	0.07 (1.91)

15 10

IC 801 (LA7376)

1 5

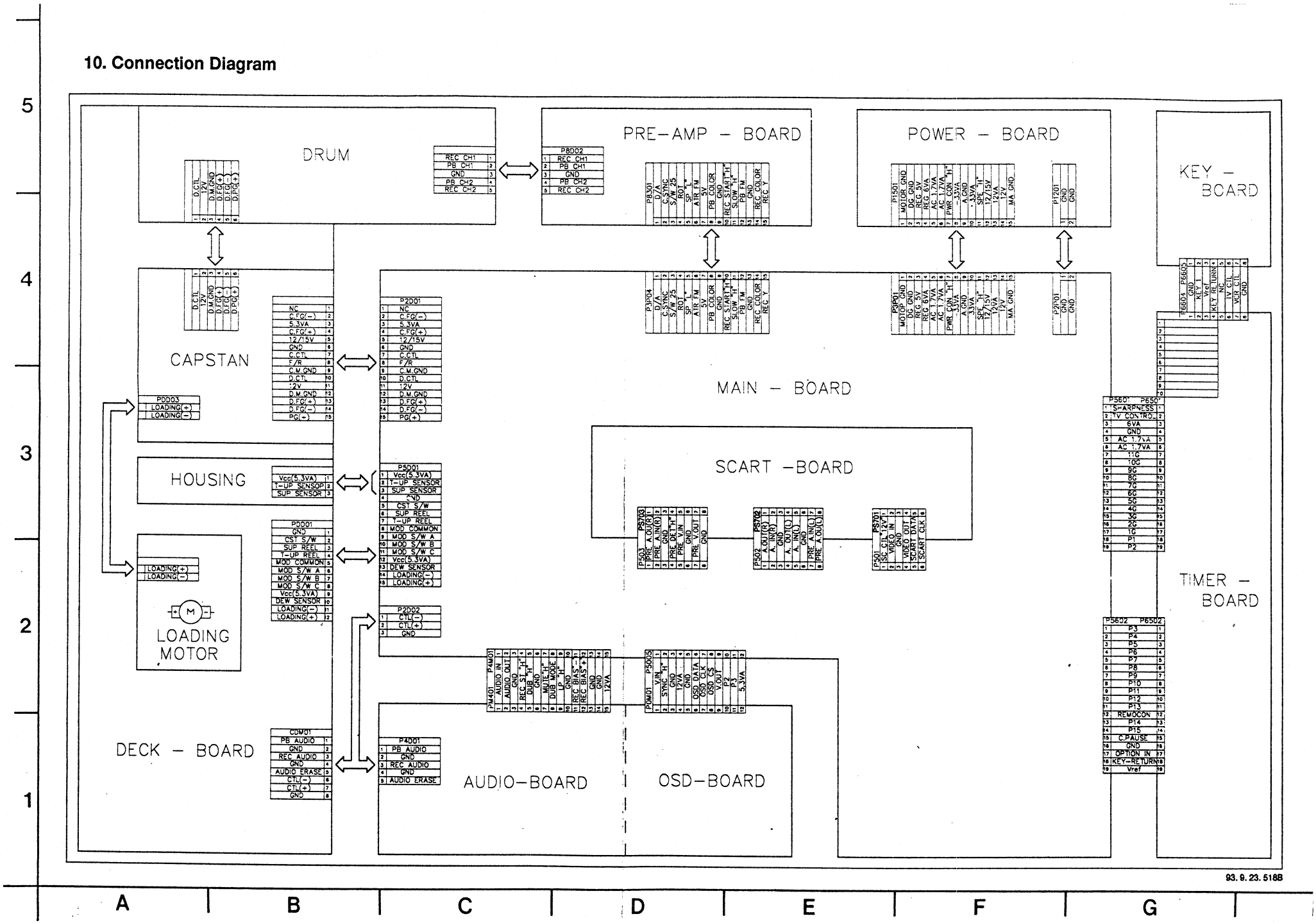
5.05 (5.0)	2.84 (0)	0.86 (0.86)	2.04 (4.57)	0 (0)	2.52 (4.02)	0.82 (0.05)	2.0 (1.65)

*** Pre-Amp TR Voltage Sheet**

(PB/REC mode)

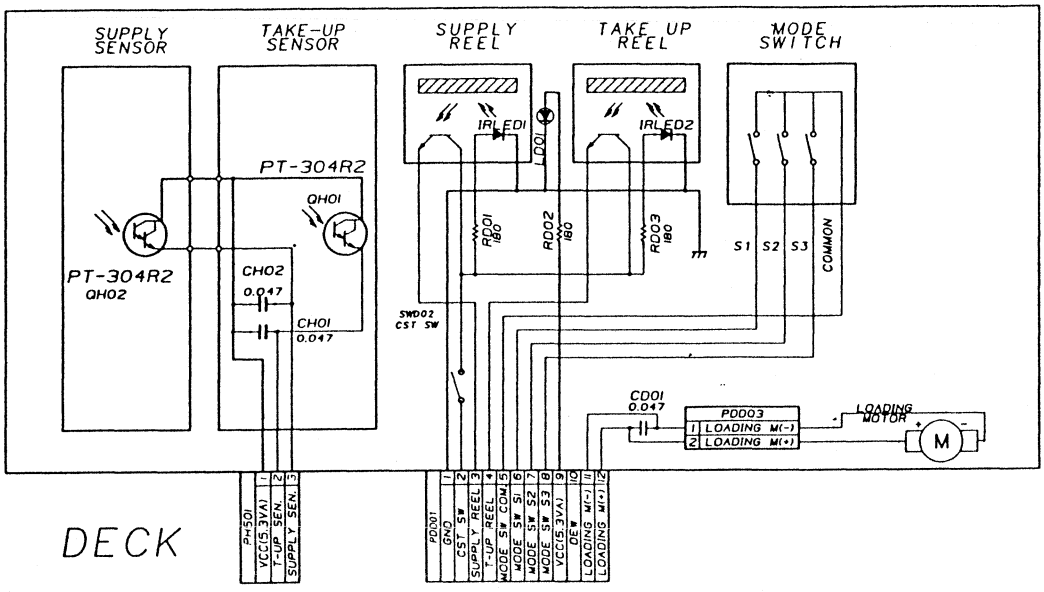
Port / TR No.	Emitter	Collector	Base
Q801	1.89/2.62	5.08/5.09	2.53/3.28
Q802	2.62/1.89	5.08/5.09	3.27/2.54
Q803	3.23/0	1.77/0	2.55/0
Q804	0.75/0	2.21/0	1.40/0
Q805	1.62/0	5.03/0	2.21/0
Q806	0/0	2.39/2.39	2.58/2.58
Q808	2.25/0	5.1/5.10	2.89/0
Q809	5.1/5.11	5.05/0	4.37/5.10
Q810	0/0	0/5.10	5.13/0

10. Connection Diagram

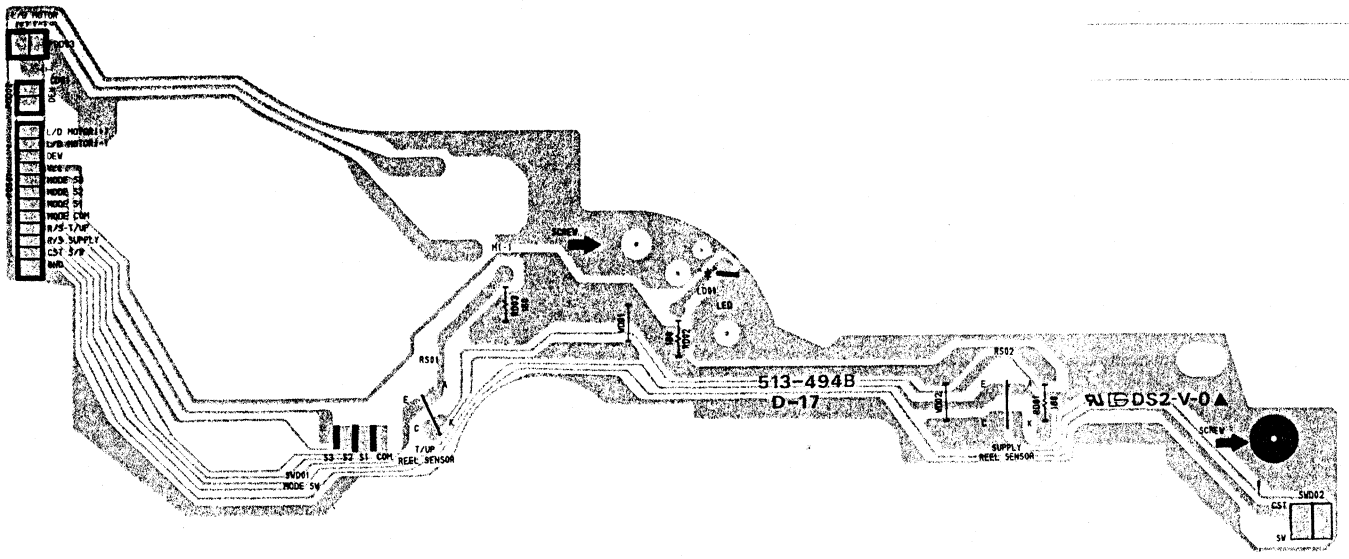


DECK JUNCTION

1. Deck Junction Circuit Diagram



2. Deck Junction P.C.Board



(Solder Side)

MEMO

• TR Voltage Sheet

PORT / TR NO.	EMITTER	COLLECTOR	BASE	REMARK
Q201	5.02/5.02	1.16/1.16	4.94/4.95	PB/REC mode
Q202	5.02/5.02	1.15/1.15	4.94/4.95	
Q203	5.02/5.02	2.67/2.66	4.97/4.95	
Q204	5.02/5.02	1.16/1.16	4.94/4.95	
Q205	0.01/0.01	5.02/5.02	0.01/0.01	
Q207	4.94/2.38	4.61/2.38	5.01/4.39	
Q208	2.51/2.50	2.41/2.41	0.01/0.01	
Q301	5.02/0	0.07/0	4.99/0	SP mode
	5.01/0	4.97/0	0.02/0	LP MODE
Q302	0/0	0/0	0/0	SP mode
	0/0	0/0	0/5.01	LP mode
Q303	0/0	0/0	4.96/0	
Q304	3.93/3.03	0/0	2.78/2.41	
Q305	4.0/3.64	0/0	3.4/3.03	
Q306	0/0	0/0	5.04/0	PB/REC mode
Q307	0/0	4.55/4.54	0.12/0.11	
Q308	1.17/0	5.05/0	1.78/0	
Q309	2.79/0	5.03/0	3.40/0	
Q310	0.89/0	1.56/0	1.51/0	
Q311	0.95/0	5.03/0	1.56/0	
Q312	0/0	0/5.1	5.09/0	
Q313	5.11/5.1	5.05/0	4.32/5.1	
Q314	1.0/0.63	0/0	0.39/0	
Q315	2.01/0	0/0	1.38/0	
Q316	2.8/0	5.01/0	3.41/0	
Q321	0/0	0/0	5.01/5.01	SP mode
	0/0/	5.11/5.1	0/0	LP mode
Q401	9.1/9.1	12.0/12.0	9.9/9.9	PB/REC [DUB]
Q402	0.0/0.0 [0.0]	6.4/0.0 [6.4]	0.0/5.0 [0.0]	mode
Q403	0.0/0.0 [0.0]	0.0/0.5 [0.0]	6.4/0.0 [6.4]	
Q404	0.0/0.5 [0.0]	9.1/8.5 [9.1]	0.0/0.5 [0.0]	
Q405	0.0/0.0 [0.0]	6.3/0.0 [0.0]	0.0/0.5 [5.0]	
Q406	0.0/0.0 [0.0]	0.0/0.5 [0.5]	5.4/0.0 [0.0]	
Q407	0.0/0.5 [0.5]	9.1/8.5 [8.5]	0.0/0.5 [0.5]	
Q501	0.00/0.00	0.01/0.01	4.96/4.96	PB/REC
Q502	0.00/0.00	PULSE/PULSE	PULSE/PULSE	mode
Q503	0.00/0.00	PULSE/PULSE	PULSE/PULSE	
Q504	5.16/5.16	0.01/0.01	5.11/5.11	
Q505	10.69/10.66	0.01/0.01	11.01/10.98	
Q506	0.01/0.01	5.15/5.15	0.01/0.01	
Q507	11.96/11.93	11.95/11.91	11.20/11.16	
Q508	0.01/0.01	0.05/0.05	4.43/4.43	
Q509	0.00/0.00	4.87/4.84	0.01/0.05	
Q601	0.01/0.01	0.06/0.06	2.78/2.78	PB/REC
Q602	0.00/0.01	5.05/5.05	0.01/0.01	mode
Q701	1.5	12	2.3	
Q703	3.6	3.7	4.3	
Q704	3	12	3.7	
Q709	4.9	12	5.5	
Q711	4.8	12	5.3	
Q712	4.9	4.9	4.3	
Q713	0	0	4.6	
Q936	5	5.6	12	
Q937	5	5.4	12	

• IC Voltage Sheet

PB(REC)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
1.91 (5.00)	2.50 (2.50)	0.78 (0.78)	0.82 (0.84)	3.80 (3.80)	5.03 (5.02)	0.50 (0.50)	0.01 (0.01)	0.04 (0.04)	2.51 (2.50)	2.51 (0.01)	2.51 (2.50)	2.58 (2.57)	2.59 (2.59)	2.60 (2.59)	0.01 (0.00)	5.00 (5.00)	1.90 (3.60)	5.03 (5.02)	2.66 (2.65)	2.50 (2.50)	2.51 (2.50)	2.51 (2.50)	2.51 (2.50)	2.51 (2.50)	0.01 (0.01)	2.51 (2.80)	2.51 (2.10)
3.60 (3.60)	0.00 (0.00)	0.00 (0.00)	4.97 (4.96)	0.01 (0.01)	0.28 (0.28)	2.06 (2.06)	0.01 (0.01)	2.59 (2.58)	2.64 (2.64)	2.64 (2.64)	1.27 (1.27)	2.50 (2.50)	2.52 (2.51)	2.52 (2.52)	2.52 (2.52)	2.52 (2.52)	2.39 (2.38)	0.01 (0.01)	2.53 (2.53)	2.53 (2.52)	2.52 (2.52)	2.52 (2.51)	2.52 (2.51)	2.51 (2.50)	2.63 (2.61)	2.66 (2.63)	5.02 (5.02)

IC201(HD49756NT)

PB(REC)

IC202(BA728N)

1	2	3	4	5	6	7	8
2.27 (2.27)	2.27 (2.27)	2.26 (2.26)	0.01 (0.01)	0.01 (0.01)	0.00 (0.00)	0.09 (0.09)	5.02 (5.02)

PB(REC)

IC203(BA7048N)

1	2	3	4	5	6	7	8	9	10
5.02 (5.02)	1.64 (1.63)	4.97 (4.96)	0.00 (0.00)	2.47 (2.47)	2.47 (2.47)	0.82 (0.29)	1.51 (0.36)	0.01 (0.01)	0.01 (0.01)

PAL mode PB(REC)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.38 (2.41)	0.63 (0.63)	3.63 (3.21)	3.37 (3.37)	1.44 (1.40)	3.21 (3.21)	0.57 (0)	4.96 (4.99)	2.05 (2.02)	0 (0)	0.53 (0.51)	4.19 (4.19)	4.96 (4.95)	1.96 (1.96)	1.98 (1.99)	2.69 (2.54)	3.20 (3.20)	3.19 (3.19)
2.32 (0)	2.79 (2.42)	2.48 (2.75)	4.44 (2.68)	4.43 (2.68)	4.50 (4.49)	2.39 (2.29)	3.16 (2.25)	2.13 (2.13)	0 (0)	2.05 (2.09)	2.51 (2.53)	1.73 (1.69)	2.96 (2.97)	2.27 (2.55)	2.18 (2.19)	3.65 (3.66)	2.55 (3.26)

2.45 : PB (2.44):(REC) MESECAM mode

IC 301 (LA7390)

PB : 3.94 (REC): (3.93) MESECAM mode

PB(REC)

IC 302 (MSM7403)

1	2	3	4	5
8.51 (0)	2.60 (0)	2.12 (0)	2.05 (0.2)	
5.01 (0)	0 (0)	5.01 (0)	3.42 (0)	

PAL mode PB(REC)

IC 303 (BA7025L)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5.1 (5.09)	5.1 (5.09)	0 (0)	0 (0)	0 (0)	3.65 (3.76)	0 (0)	3.65 (3.76)	0 (0)						
3.7 (3.68)	0 (0)	0 (0)	3.7 (3.68)	4.56 (4.55)	0 (0)	4.54 (4.51)	0 (0)	3.1 (3.1)						

MESECAM mode PB(REC)

IC 303 (BA7025L)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
5.1 (5.09)	5.1 (5.09)	4.44 (4.43)	0 (0)	4.26 (4.26)	3.58 (3.59)	4.33 (4.32)	3.57 (3.57)	0 (0)						
3.7 (3.69)	0 (0)	0 (0)	3.7 (3.69)	4.55 (4.54)	0 (0)	4.56 (4.54)	0 (0)	3.1 (3.1)						

IC304(NJM2249L)

1	2	3	4	5	6	7	8
4.6	0.05	4.8	0.05	5.3	11.7	4.4	0

PB(REC)[DUB]

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
[4.8]	[0.0]	[4.0]	[4.2]	[0.0]	[4.2]	[4.1]	[1.2]	[4.1]	[4.2]	[0.5]	[2.8]								
1.0 (4.8)	0.0 (0.0)	4.0 (4.0)	4.2 (4.2)	0.0 (0.0)	4.2 (4.2)	4.1 (4.1)	1.2 (1.2)	1.1 (4.1)	4.2 (4.2)	0.0 (0.5)	2.8 (2.8)								
0.0 (0.0)	3.4 (3.4)	0.0 (0.0)	0 (0.0)	9.0 (9.0)	3.4 (3.4)	9.1 (9.1)	3.6 (3.6)	0.0 (0.0)	3.6 (3.6)	5.0 (0.0)	4.1 (4.1)								
[0.0]	[3.4]	[0.0]	[0.0]	[9.0]	[3.4]	[9.1]	[3.6]	[0.0]	[3.6]	[0.0]	[4.1]								

IC401(BA7790LS)

PB(REC)

IC502 (SDA2586)

1	2	3	4	5	6	7	8
4.88 (4.84)	0.08 (0.08)	0.27 (0.31)	0.28 (0.34)				
0.00 (0.00)	0.00 (0.00)	0.01 (0.00)	0.00 (0.00)				

PB(REC)

IC503 (PST523G)

1	2	3
4.98 (4.98)	0 (0)	4.98 (4.98)

PB(REC)

IC504(GL7445)

1	2	3	4	5	6	7	8	9	10
0.00 (0.00)	0.58 (0.56)	0.80 (0.78)	0.64 (0.59)	1.78 (1.77)	1.79 (1.78)	12.8 (12.82)	12.82 (12.82)	0.80 (0.80)	0.58 (0.57)

PB(REC)

IC505(GD4066B)

1	2	3	4	5	6	7	8	9	10	11	12	13	14
4.87 (4.85)	0.02 (0.05)	0.02 (0.05)	0.28 (0.33)	0.93 (0.81)	0.28 (0.33)	0.28 (0.35)							
0.28 (0.33)	0.93 (0.83)	0.28 (0.33)	0.68 (0.33)	4.87 (4.84)	4.87 (4.84)	0.00 (0.01)							

PB(REC)

IC701(LA7545)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.8	6.0	4.7	6.6	6.6	5.3	9.5	9.8							
5.4	4.9	11.1	0	4.4	4.4	3.17	9.18							

PB(REC)

IC7A1(SAA4700)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
2.4	2.4	0	0	4.6	0.8	0	0	4.61						
2.4	2.4	0	0	4.4	0.36	4.61	0.4	0.5						

PB(REC)

IC 801 (LA7376)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
0.67 (0)	0 (4.16)	0 (0)	0 (4.16)	0.67 (0.04)	0 (4.15)	1.58 (1.86)	0.07 (1.91)							
5.05 (5.0)	2.84 (0)	0.86 (0.86)	2.04 (4.57)	0 (0)	2.52 (4.02)	0.82 (0.05)	2.0 (1.65)							

PB(REC)

IC931(BA7021)

1	2	3	4	5	6	7	8
0	4.1	2.5	0	0	2.5	0	1.5	5.6

PB(REC)

IC932(HA118104)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1.8	4.5	2.1	0	2.8	2.3	2.7	0							
2.5	0	2.2	4.5	1.9	5.6	2.5	2.1							

IC935(GL3816)

1	2	3	4	5	6	7	8
12	8	0	7.2	0	0	7.8	0

IC933(LA7222)

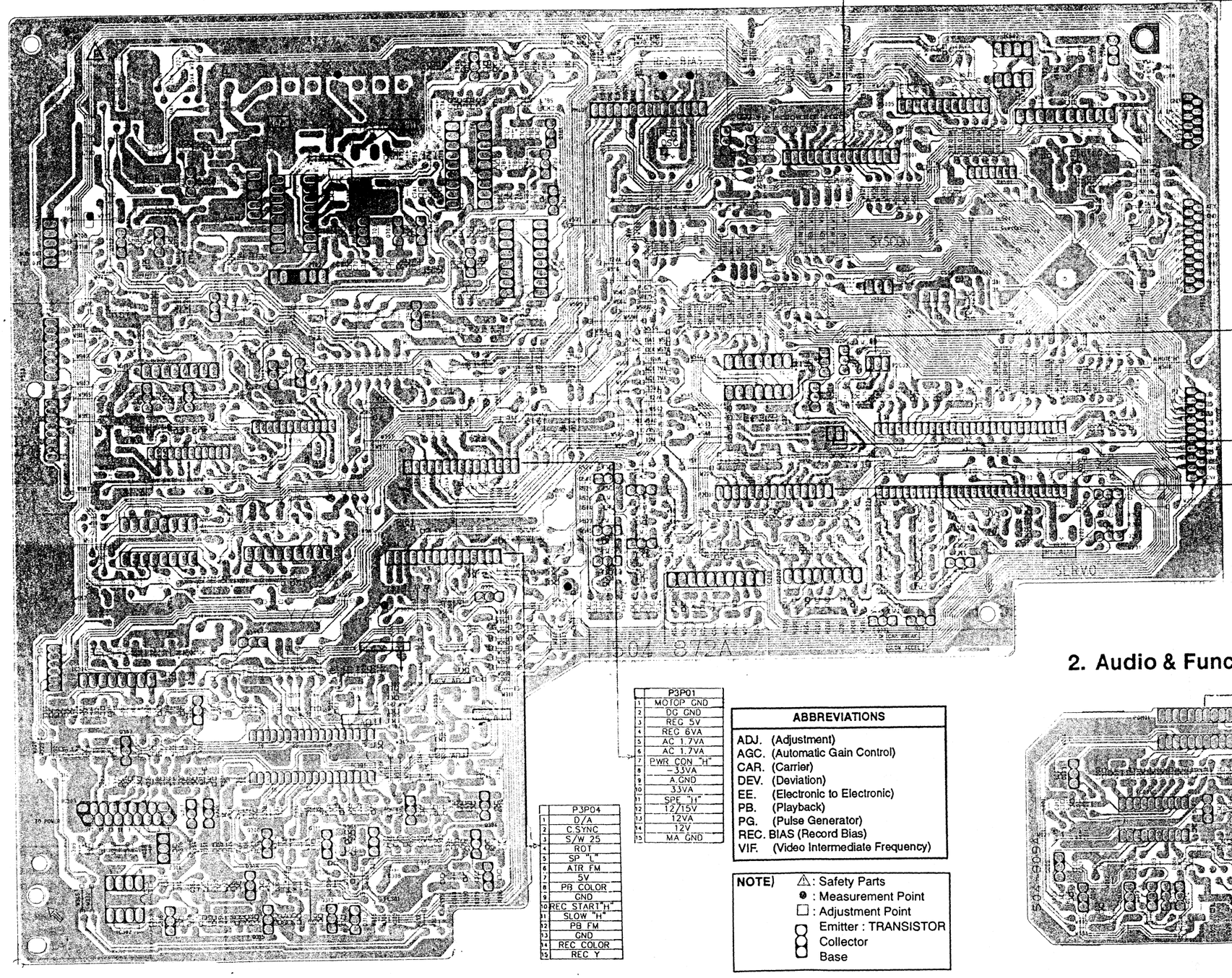
1	2	3	4	5	6	7	8	9	10	11
0	0	0	4.2	8	0	8	7.4	12	8	7.4	8

IC934(LA7222)

1	2	3	4	5	6	7	8	9	10	11
0	4.5	0	4.5	8	0	8	7.2	12	8	7.4	8

PRINTED CIRCUIT BOARD DIAGRAMS

1. Main P.C.Board



LOCA. No.	Position
IC201	3E
IC202	2D
IC203	2D
IC301	2B
IC302	1A
IC303	1A
IC304	2A
IC501	4E
IC502	5E
IC503	4D
IC504	4E
IC505	3D
IC7A1	4C
IC701	4B
IC731	3B
IC932	3A
IC933	3A
IC934	3B
IC935	3A
Q201	3F
Q202	3F
Q203	2E
Q204	2D
Q205	2E
Q207	3D
Q208	3D
Q301	1A
Q302	2A
Q303	2B
Q304	1C
Q305	1B
Q306	1B
Q307	2A
Q308	1B

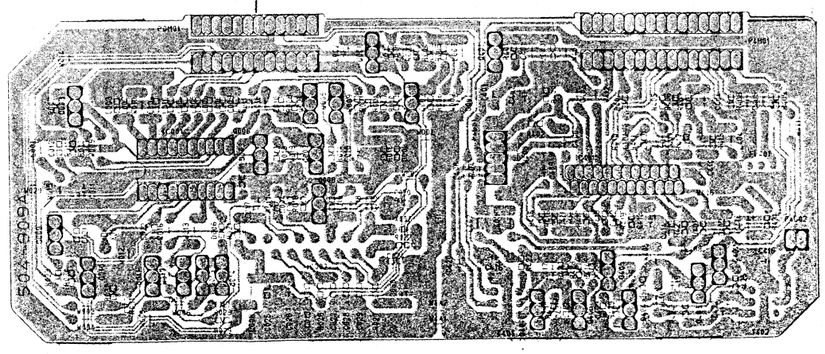
LOCA. No.	Position
Q309	1C
Q310	1C
Q311	1B
Q312	1B
Q313	1B
Q314	1B
Q315	1B
Q316	1A
Q320	1B
Q321	2C
Q501	5F
Q502	4D
Q503	4D
Q504	3C
Q505	3C
Q506	3C
Q507	3C
Q508	3C
Q509	3D
Q701	4A
Q702	4A
Q703	4B
Q704	4B
Q709	4A
Q711	5C
Q712	4B
Q713	3B
Q781	4C
Q782	4C
Q784	4C
Q935	3B
Q936	3A
Q937	3A

ABBREVIATIONS

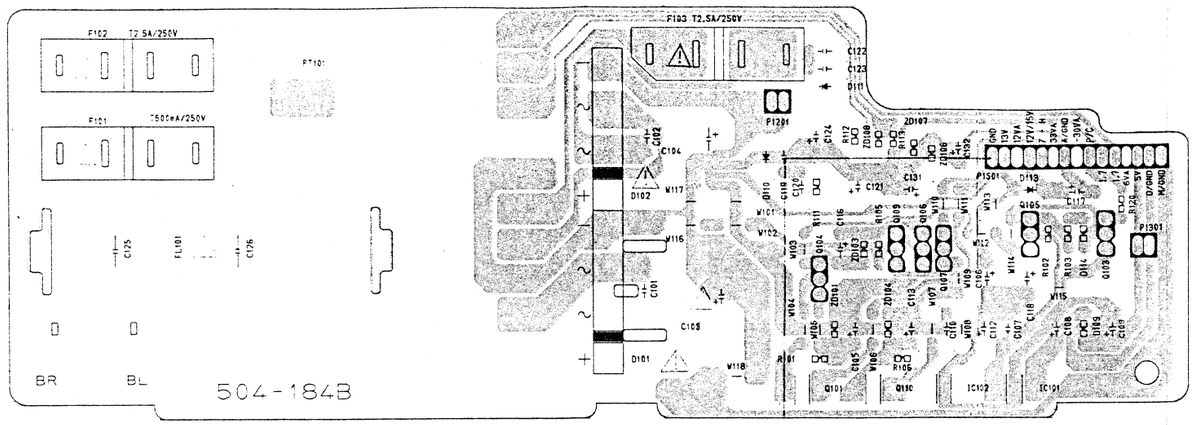
ADJ. (Adjustment)
AGC. (Automatic Gain Control)
CAR. (Carrier)
DEV. (Deviation)
EE. (Electronic to Electronic)
PB. (Playback)
PG. (Pulse Generator)
REC. BIAS (Record Bias)
VIF. (Video Intermediate Frequency)

NOTE)
⚠ : Safety Parts
● : Measurement Point
□ : Adjustment Point
Emitter : TRANSISTOR
Collector
Base

2. Audio & Function OSD P.C.Board

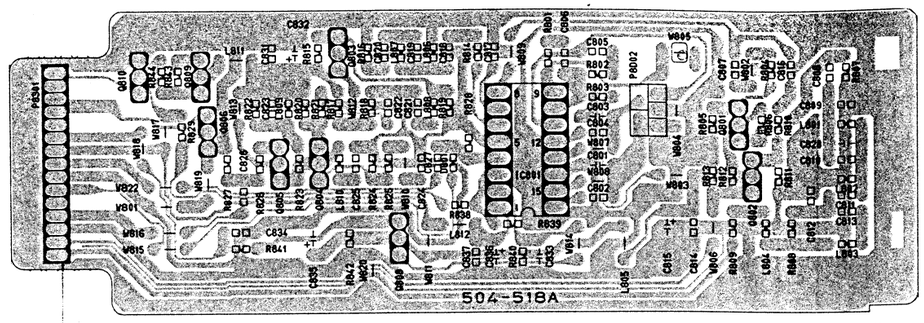


3. Power P.C.Board



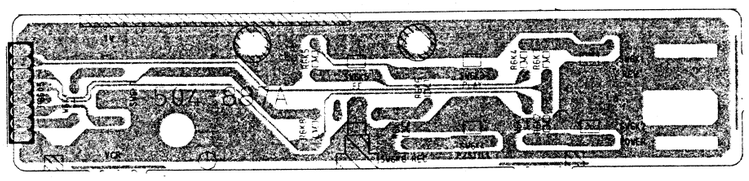
P1501	
1	MOTOR GND
2	D.GND
3	REG 5V
4	REG 8VA
5	AC 1.7V
6	AC 1.7V
7	P/C "H"
8	33VA
9	A.GND
10	33VA
11	Z-SEARCH "H"
12	12/15V
13	12VA
14	12V
15	MAIN GND

4. Pre-Amp P.C.Board



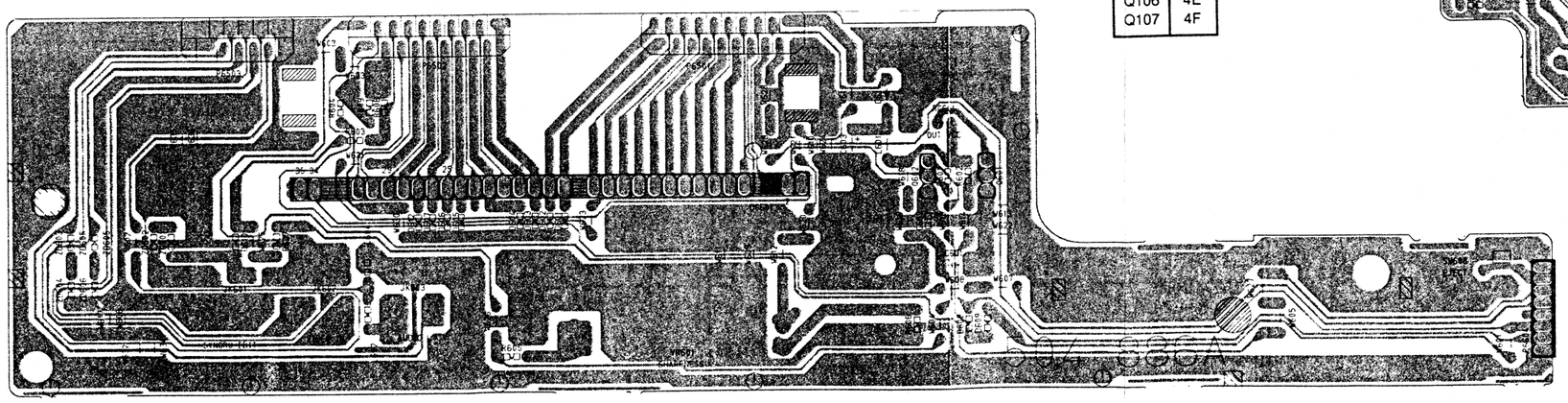
P8301	
1	D/A
2	C.SYNC
3	S/W 25
4	ROT
5	SP "L"
6	ATR FM
7	5V
8	PB COLOR
9	GND
10	REC START"H"
11	SLOW "H"
12	PB FM
13	GND
14	REC COLOR
15	REC Y

5. Key Function P.C.Board



NOTE) P.C. Boards are all solder side.

6. Timer P.C.Board



LOCA. No.	Position
IC101	2E
IC102	2E
Q101	4E
Q102	3E
Q103	3E
Q104	3D
Q105	2E
Q106	4E
Q107	4F

LOCA. No.	Position
IC801	5F
Q801	5F
Q803	5F
Q804	5F
Q807	4F
Q808	4F
Q809	4E

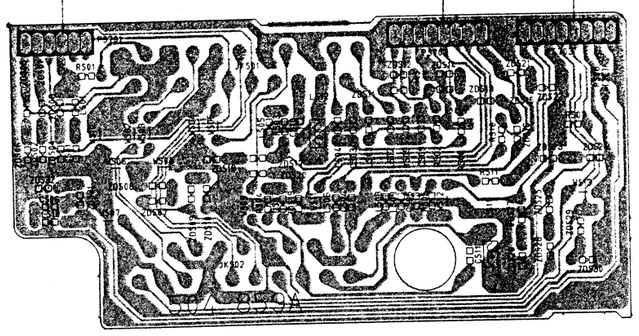
LOCA. No.	Position
Q601	1D
Q602	1D

PS701	
1	SC CTL"12V"
2	VIDEO IN
3	GND
4	VIDEO OUT
5	SCART DATA
6	SCART CLK

PS702	
1	A.OUT(R)
2	A. IN(R)
3	GND
4	A. OUT(L)
5	A. IN(L)
6	GND
7	PRE A.IN(L)
8	PRE A.OU(L)

PS703	
1	PRE A.OU(R)
2	PRE A.IN(R)
3	GND
4	PRE DET"H"
5	PRE V.IN
6	GND
7	PRE V.OUT
8	GND

7. SCART P.C.Board



NOTE)
- △ : Safety Parts
- ● : Measurement Point
- □ : Adjustment Point
- Emitter : TRANSISTOR
- Collector
- Base
- ■ : Alive Voltage